Quick Reference

MForce PowerDrive Motion Control











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, 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.
- IMS Terminal integrated program editor and terminal emulator (available online).
- +12 to +75 VDC unregulated linear or switching power supply.
- NEMA size 23 or 34 stepping motor.
- RS-422/485 communications interface (recommended: MD-CC402-001 communication converter). CANopen communications converter (recommended: MD-CC500-000).

Depending on your connector configuration, you may also need:

- I/O or I/O and encoder interface to 14-pin or 20-pin wire crimp connector (recommended: PD14-2334-FL3 or PD20-3400-FL3 prototype development cable).
- Power interface to 2-pin wire crimp connector (recommended: PD02-3400-FL3 prototype development cable).
- Motor interface to 4-pin wire crimp connector (recommended: PD04-MF34-FL3 prototype development cable).

* If you purchased your MForce PowerDrive 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/mforce_overview.html.

Connecting the Motor, Power and I/O

Your MForce PowerDrive is configured with power, I/O and motor 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 kits

Connecting Communications — RS-422/485

- Connect RS-422/485 communications converter to MForce and PC. 1.
- 2. Install the communication converter drivers onto PC (available online).
- Install and open IMS Terminal.
- Apply power to MForce PowerDrive.
- Within IMS Terminal, Click into the terminal window (shown below).
- Key in CTRL+C. The sign-on message: "Copyright 2001-2008 by Intelligent Motion Systems, Inc." should appear, verifying that communications is active.



Connecting Communications — CANopen

A "Getting Started" tutorial using the CANopen Tester GUI with the MD-CC500-000 USB to CANopen dongle is located in the CANopen implementation manual, available online

General Specifications

Electrical Specifications	
Input Voltage (+V) Range*	+12 to +75 VDC
Max Power Supply Current (Per MForce Pow	verDrive)* 4 A
Output Current (RMS)	5.0 Amps
Output Current (Peak)	7.0 Amps
Aux-Logic Input Voltage**	+12 to +24 VDC
Aux-Logic Input Current**	230 mA Max

^{*}Actual Power Supply Current will depend on voltage and load **Used to power logic circuitry in the absence of +V.

Environmental Specifications		
Operating Temperature — measured at the he	eat sink	-40°C to +85°C
(non-condensing)		-40 C 10 +65 C

I/O Specifications	
General Purpose I/O - Number and Type	е
I/O Points 1-4, 9-12	8 I/O programmable as inputs outputs (sinking or sourcir
General Purpose I/O - Electrical	•
Inputs	TTL up to +24 VI
Sinking Outputs	Up to +24 VE
Sourcing Outputs	+12 to +24 VI
Output Sink Current	up to 600 r (One Channel in each I/O Bar
Logic Threshold (Logic 0)	< 0.8 VI
Logic Threshold (Logic 1)	> 2.2 VI
Protection (Sinking)	Over Temp, Short Circ
Protection (Sourcing)	Transient Over Voltag Inductive Clar
Analog Input	
Resolution	10
Range (Voltage Mode)	0 to +5 VDC, 0 to +10 VI
Range (Current Mode)	4 to 20 mA, 0 to 20r
Clock I/O	
Types	Step/Direction, Up/Down, Quadratu
Logic Threshold	+5V TTL Input, TTL Out (with 2 kΩ Load to Grour
Trip Output/Capture Input	
Logic Threshold	+5V TTL Input, TTL Outp (with 2 kΩ Load to Grour

Communications Specifications	
Protocol	RS-422/RS-485
BAUD Rate	4.8k, 9.6k, 19.2k, 38.4k, 115.2 kbps
CANopen Option	
Protocol	CAN 2.0B Active
Communications Profile	CiA DS-301
BAUD Rate Note: 800 kbps not supported by the MD-CC500-000 USB to CANopen dongle.	10, 20, 50, 125, 250, 500, 800 kBit/s, 1MBit/s (default)

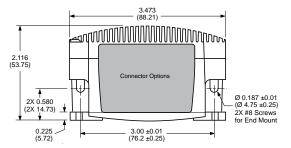
Motion Sp	ecificatio	ns							
Microstep	Resoluti	on - Ope	n Loop						
Number of	Resolutio	ns							2
			Avail	able Micro	steps Per I	Revolution			
200	400	800	1000	1600	2000	3200	5000	6400	10000

200	400	000	1000	1000	2000	3200	3000	0400	10000	1
12800	20000	25000	25600	40000	50000	51200	36000 ¹	21600 ²	25400 ³	
1=0.01 de	g/µstep	2=1 ard	c minute	/µstep	3=0.001	mm/µste	р			

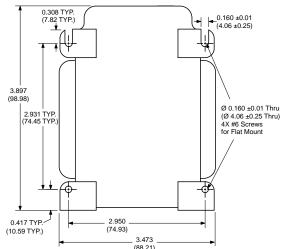
Software Specifications	
Program Storage Type/Size	Flash/6384 Bytes
User Program Labels and Variables	192
Party Mode Addresses	62

Mechanical Specifications

FRONT VIEW

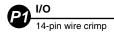


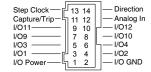
BOTTOM VIEW



MForce PowerDrive Motion Control Connectivity Options

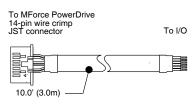






Prototype Development Cable p/n: PD14-2334-FL3

Speed test and development with pre-wired mating connector.



Pair	Wire	Function
	Colors	
1	White	Step Clock
'	Black	Direction
2	Green	Capt/Trip
	Black	Analog In
3	Blue	I/O11
٥	Black	I/O12
4	Yellow	1/09
4	Black	I/O10
5	Brown	I/O3
5	Black	1/04
6	Orange	1/01
l °	Black	1/02
7	Red	I/O Power
	Black	I/O Ground

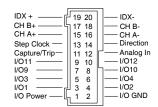
Mating Connector Kit p/n: CK-09

Use to make your own cables, kit contains 5 mating connector shells with crimp pins. JST crimp tool recommended.

JST Parts Shell: PADP-14V-1-S

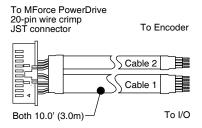
Pins: SPH-001T-P0.5L

I/O & Remote Encoder 20-pin wire crimp



Prototype Development Cable p/n: PD20-3400-FL3

Speed test and development with pre-wired mating connector.



Pair	Wire Colors	Function
Cable	e 1	
1	White	Step Clock
'	Black	Direction
2	Green	Capt/Trip
	Black	Analog In
3	Blue	I/O11
٥	Black	I/O12
4	Yellow	1/09
4	Black	I/O10
5	Brown	I/O3
5	Black	1/04
6	Orange	I/O1
6	Black	I/O2
	Red	I/O Power
'	Black	I/O Ground

Cabl	e 2	
1	White w/Blue Stripe	CH A+
- 1	Blue w/White Stripe	CH A-
2	White w/Orange Stripe	
2	Orange w/White Stripe	CH B-
3		IDX+
3	Green w/White Stripe	IDX-

Mating Connector Kit p/n: CK-11

Use to make your own cables, kit contains 5 mating connector shells with crimp pins. JST crimp tool recommended.

Shell: PADP-20V-1-S Pins: SPH-001T-P0.5L JST Parts



Communications — CANopen Version

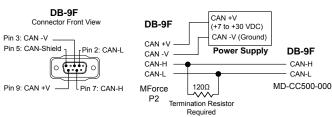
DB-9 (female)

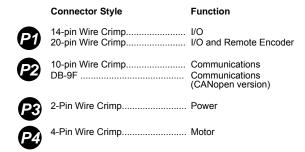
Communications Converter p/n: MD-CC500-000

Electrically isolated in-line USB to CANopen converter. USB "A" Type connector to DB-9 (male). An interface cable must be constructed by the user

Mating Cable Requirements

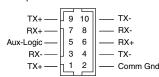
Parts required: (2) DB-9 (female) connectors. +7 to +30 VDC power supply and (1)120 Ω 1% terminating resistor





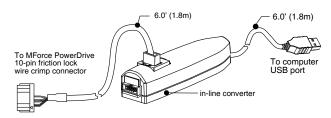
Communications — RS-422/485 **P**2

10-pin wire crimp



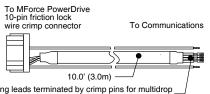
Communications Converter p/n: MD-CC402-001

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



Prototype Development Cable p/n: PD10-1434-FL3

Speed test and development with pre-wired mating connector. Recommende for multi-drop systems, can be used in conjunction with the MD-CC402-001.



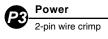
Wire Colors	Function
White/Red Stripe	Aux-Logic
White/Blue Stripe	TX+
Blue/White Stripe	TX-
White/Orange Stripe	RX+
Orange/White Stripe	RX-
Green/White Stripe	GND

Flying leads terminated by crimp pins for multidrop connection (see product manual)

Mating Connector Kit p/n: CK-02

Use to make your own cables, kit contains 5 mating connector shells with crimp pins. Hirose crimp tool recommended.

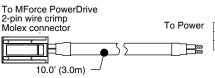
Shell: DF11-10DS-2C Pins: DF11-2428SC Hirose Parts





Prototype Development Cable p/n: PD02-3400-FL3

Function: Power Interface

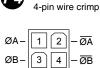


Function Wire Colors

Mating Connector Kit p/n: CK-05

Use to make your own cables, kit contains 5 mating connector shells with crimp pins. Tyco crimp tool recommended.

Shell: 510-67-0200 Molex Parts Pins: 502-17-91011

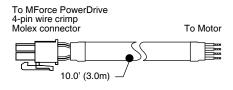


Motor



Prototype Development Cable p/n: PD04-MF347-FL3

Function: Motor Interface



Wire Colors	Function
Black (Pair 1)	Phase B
White (Pair 1)	Phase B\
Black (Pair 2)	Phase A
White (Pair 2)	Phase A\

Note that pairs are marked with the pair number.

Mating Connector Kit p/n: CK-07

Use to make your own cables, kit contains 5 mating connector shells with crimp pins. Molex crimp tool recommended.

Shell: 39-01-2045 Molex Parts

Pins: 44476-3112