Quick Reference

MDrive23Plus Motion Control

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/mdrive23plus_mdi.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. (Recommended: IMS IP804 or ISP300-7)
- RS-422/485 communications interface. (Recommended: IMS MD-CC400-001 or MD-CC402-001 Communication Converters) or CANopen communications converter. (Recommend MD-CC500-000)

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

- Power interface to 2-pin wire crimp connector. (Recommended: IMS PD02-2300-FL3 Prototype Development Cable)
- If using the 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 interface to 14-pin wire crimp connector. (Recommended: IMS PD14-2334-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

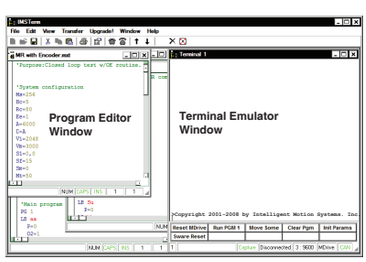
All documentation, software and resources are available online at: http://www.imshome.com/mdrive23plus_mdi.html

Connecting Power and I/O

Your MDrivePlus may be configured with power and I/O combined on a single connector, or with separate connectors. 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 — RS-422/485

1. Connect IMS RS-422/485 communications converter to MDrivePlus and PC.
2. Install the communication converter drivers onto PC (available online).
3. Install and open IMS Terminal.
4. Apply power to MDrivePlus.
5. Within IMS Terminal, Click into the Terminal Window (shown below).



6. Key in CTRL+C. The MDrivePlus 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 IMS CANopen Tester GUI with the MD-CC500-000 USB to CANopen dongle is available online at: http://www.imshome.com/canopen_gs.html.

General Specifications

Electrical Specifications	
Input Voltage (+V) Range*	+12 to +75 VDC
Max Power Supply Current (Per MDrive17Plus)*	2 A
Aux-Logic Input Voltage**	+12 to +24 VDC
Aux-Logic Input Current**	194 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 (non-condensing)	Heat Sink	-40°C to +85°C
	Motor	-40°C to +100°C

I/O Specifications	
General Purpose I/O - Number and Type	
Plus (I/O Points 1-4)	4 I/O programmable as inputs (sinking or sourcing) or outputs (sinking)
Plus[2] (I/O Points 1-4, 9-12)	8 I/O programmable as inputs or outputs (sinking or sourcing)
General Purpose I/O - Electrical	
Inputs	TTL up to +24 VDC
Sinking Outputs (All)	Up to +24 VDC
Sourcing Outputs (Plus[2])	+12 to +24 VDC
Output Sink Current (Plus)	up to 600 mA (One Channel)
Output Sink Current (Plus[2])	up to 600 mA (One Channel in each I/O Bank)
Logic Threshold (Logic 0)	< 0.8 VDC
Logic Threshold (Logic 1)	> 2.2 VDC
Protection (Sinking)	Over Temp, Short Circuit
Protection (Sourcing)	Transient Over Voltage, Inductive Clamp
Analog Input	
Resolution	10 Bit
Range (Voltage Mode)	0 to +5 VDC, 0 to +10 VDC
Range (Current Mode)	4 to 20 mA, 0 to 20mA
Clock I/O	
Types	Step/Direction, Up/Down, Quadrature
Logic Threshold	+5V TTL Input, TTL Output (with 2 kΩ Load to Ground)
Trip Output/Capture Input	
Logic Threshold	+5V TTL Input, TTL Output (with 2 kΩ Load to Ground)

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 kBits/s, 1MBit/s (default)

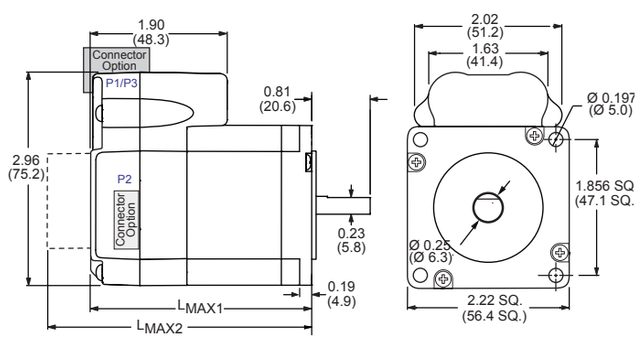
Motion Specifications	
Microstep Resolution - Open Loop	
Number of Resolutions	20

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

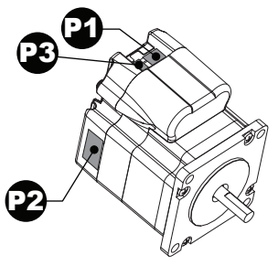
Software Specifications	
Program Storage Type/Size	Flash/6384 Bytes
User Program Labels and Variables	192
Party Mode Addresses	62

Mechanical Specifications



	Dimensions in inches (mm)	
Motor Length	**LMAX (Single Shaft or Internal Encoder)**	**LMAX2 (Control Knob)**
Single	2.65 (67.31)	3.36 (85.34)
Double	3.02 (76.71)	3.73 (94.74)
Triple	3.88 (98.55)	4.59 (116.59)

MDrive23Plus Motion Control Connectivity Options

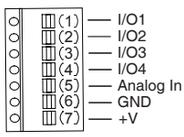


	Connector Style	Function
P1	Pluggable Terminal.....	I/O and Power
	Flying Leads.....	I/O and Power
	14-pin Wire Crimp.....	I/O
P2	10-pin Wire Crimp.....	Communications
	10-pin IDC.....	Communications
	DB-9 (male)	Communications (CANopen Option)
P3	2-pin Wire Crimp.....	Power

P1 I/O & Power

Pluggable terminal or flying leads

Pluggable Terminal



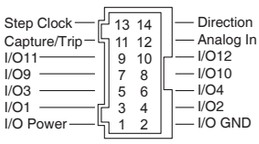
User Supplied Recommended Wire: 22 AWG Stranded

Flying Lead Colors

Wire Color	Function
White/Yellow	I/O1
White/Orange	I/O2
White/Violet	I/O3
White/Blue	I/O4
Green	Analog In
Black	Ground
Red	+V

P1 I/O

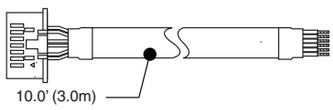
14-pin wire crimp



Remote Encoder Option	
Pin	Function
7	CH A +
8	CH A-
9	CH B+
10	CH B-
13	IDX +
14	IDX-

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

Speed test and development with pre-wired mating connector.



Pair	Wire Colors	Function	Encoder Function
1	Black	Direction	IDX+
	White	Step Clock	IDX-
2	Black	Analog In	Analog In
	Green	Capt/Trip	Capt/Trip
3	Black	I/O12	CH B-
	Blue	I/O11	CH B+
4	Black	I/O10	CH A-
	Yellow	I/O9	CH A +
5	Black	I/O4	I/O4
	Brown	I/O3	I/O3
6	Black	I/O2	I/O2
	Orange	I/O1	I/O1
7	Black	I/O Ground	I/O Ground
	Red	I/O Power	I/O Power

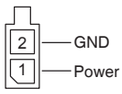
Mating Connector Kit p/n: CK-09

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
	Crimp Tool:	YHT 2622

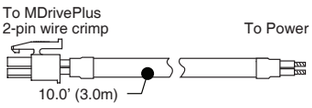
P3 Power

2-pin wire crimp



Prototype Development Cable p/n: PD02-2300-FL3

Function: Power Interface



Wire Colors	Function
Black	Power Ground
Red	+V

Mating Connector Kit p/n: CK-04

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

Tyco Parts	Shell:	794617-2
	Pins:	794610-1
	Crimp Tool:	91501-1

P2 Communications — CANopen Option

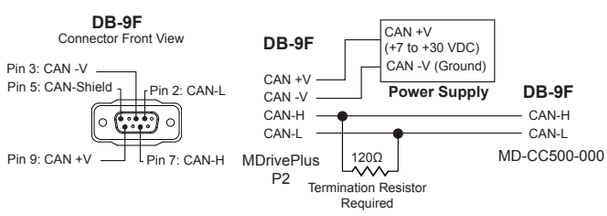
DB-9 (male)

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.

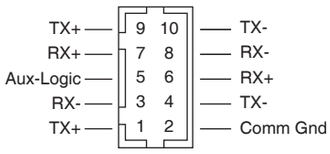
Mating Cable Requirements

The following diagram illustrates the parts and connections for an interface cable connecting the MD-CC500-000 to the MDrivePlus. Required Parts: (2) DB-9 (female), +7 to +30 VDC power supply, (1) 120Ω terminating resistor.



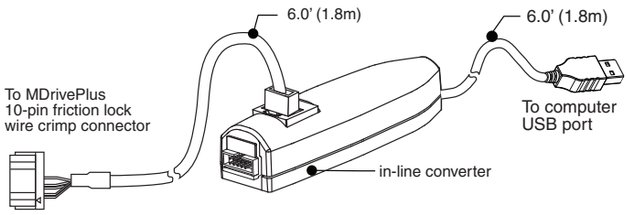
P2 Communications — RS-422/485

10-pin wire crimp



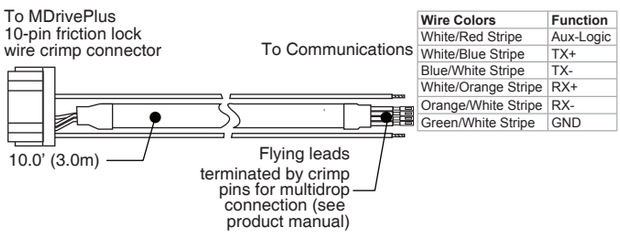
Communications Converter p/n: MD-CC402-001

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. Recommended for multi-drop systems, can be used in conjunction with the MD-CC402-001.



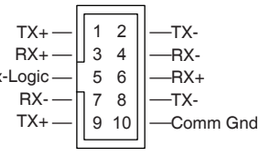
Wire Colors	Function
White/Red Stripe	Aux-Logic
White/Blue Stripe	TX+
Blue/White Stripe	TX-
White/Orange Stripe	RX+
Orange/White Stripe	RX-
Green/White Stripe	GND

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.

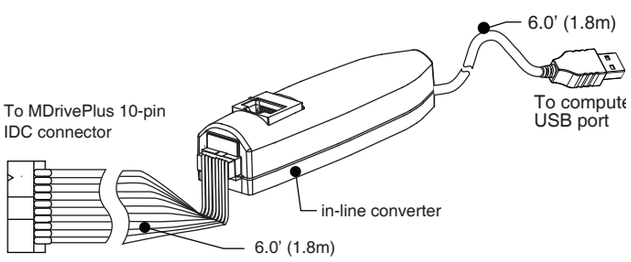
Hirose Parts:	Shell:	DF11-10DS-2C
	Pins:	DF11-2428SC
	Crimp Tool:	DF11-TA2428HC

P2 Communications — RS-422/485



Communications Converter p/n: MD-CC400-001

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



Mating Connector 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

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