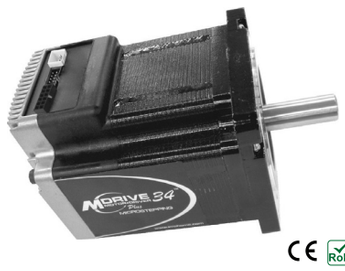
Quick Reference

MDrive® 34 Step/Direction Input



Notes and Warnings

Installation, configuration and maintenance must be carried out by qualified technicians only.

- Unexpected dangers may be encountered when working with this product!
- Incorrect use may destroy this product and connected components!
- The drives are not protected from reverse polarity power connection!

Detailed information on installation can be found in the user manuals. The user manuals are available for download from: https://novantaims.com/dloads/

Required for Setup*

- IBM compatible PC running Microsoft® Windows 7 or higher with available USB port.
- Monitor with a minimum of 1024 x 768 resolution.
- SPI Motor Interface (available online).
- +12 to +75 VDC linear or switching power supply.
- 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 (e.g., MD-CC300-001 or MD-CC303-001 communication converters).

Depending on the MDrive connectors configuration, the following may be required:

- I/O, and Communications interface to 12-pin wire crimp connector (e.g., PD12-1434-FL3 prototype development cable).
- Power interface to the 2-pin wire crimp connector (e.g., PD02-3400-FL3 prototype development cable).

** If the MDrive is purchased with a QuickStart Kit, all the connecting cables needed for initial functional setup and system testing are included.*

Getting Started

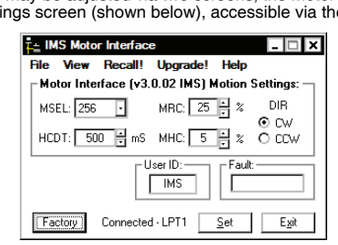
All documentation, software, and resources are available online at: https://novantaims.com/

Connecting Power and I/O

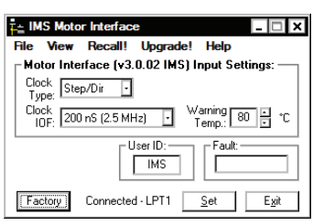
The MDrive may be configured with power and I/O combined on a single connector, or with separate connectors. Refer to "Step/Direction Input Connectivity Options" on page 2 for connecting details and available connectivity options.

Connecting Communications

1. Connect the USB of the SPI communications converter to the PC.
2. Connect the 10-pin connector of the SPI communications converter to the MDrive.
3. Install the communication converter drivers onto PC (available online).
4. Install and open SPI Motor Interface.
5. Apply power to MDrive.
6. 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

General Specifications

Electrical Specifications	
Input Voltage (+V) Range*	+12 to +75 VDC
Max Power Supply Current (Per MDrive 34)*	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

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

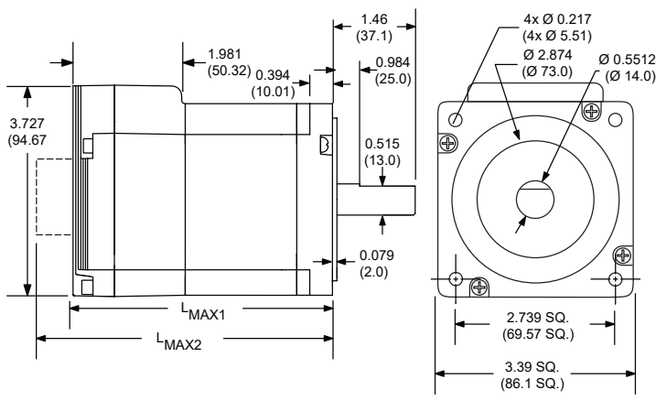
	Available Microsteps Per Revolution				
per step	1	2	4	5	8
per rev.	200	400	800	1000	1600
per step	10	16	25	32	50
per rev.	2000	3200	5000	6400	10000
per step	64	100	125	128	200
per rev.	12800	20000	25000	25600	40000
per step	250	256	180	108	127
per rev.	50000	51200	36000[1]	21600[2]	25400[3]

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

Setup Parameters

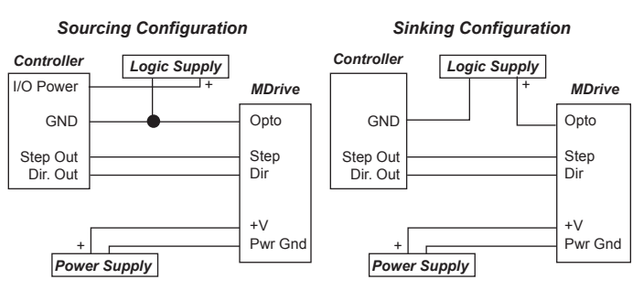
Setup Parameters				
Name	**Function**	**Range**	**Units**	**Default**
MHC	Motor Hold Current	0 to 100	Percent	5
MRC	Motor Run Current	1 to 100	Percent	25
MSEL	Microstep Resolution	See Motion Specifications	µsteps/ Full Step	256
DIR	Motor Direction Override	0/1	—	CW
HCDT	Hold Current Delay Time	0 or 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
WARN TEMP	Over Temperature Warning	0 to 125	°C	80

Mechanical Specifications



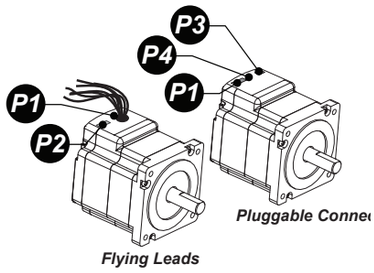
	Dimensions in inches (mm)	
Motor Length	**LMAX1 (Single Shaft)**	**LMAX2 (Control Knob)**
Single	3.81 (96.77)	4.52 (114.81)
Double	4.60 (116.84)	5.31 (134.87)
Triple	6.17 (156.72)	6.88 (174.75)

Minimum Required Connections



MDrive 34

Step/Direction Input Connectivity Options



	Connector Style	Function
P1	Flying Leads.....	I/O, Power & Encoder
	12-pin Wire Crimp.....	I/O and Communications
P2	10-pin IDC.....	Communications
P3	2-Pin Wire Crimp.....	Power
P4	10-pin Wire Crimp.....	Encoder

P1 I/O, Power and Optional Internal Encoder

Flying leads

Base Model	
Wire Color	**Function**
White	Opto Reference
Orange	Step Clock
Blue	CW/CCW Direction
Brown	Enable
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-

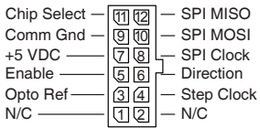
P1 I/O & Communications

12-pin wire crimp

⚠ CONNECTOR PRODUCT ALERT! October 2009

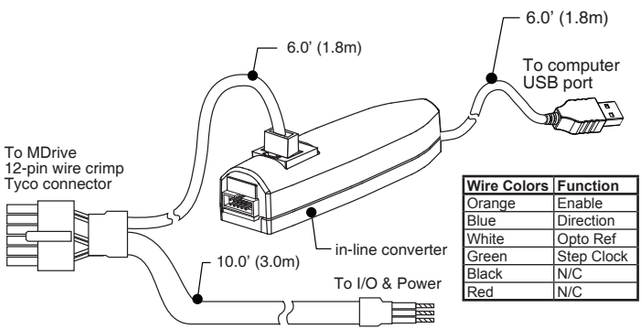
Disregard these pin number markings. Use the pin numbering scheme shown above.

The manufacturer of this 12-pin wire crimp connector has begun marking the connector shell, PN 1-794617-2 with pin numbers shown here.



Communications Converter p/n: MD-CC303-001

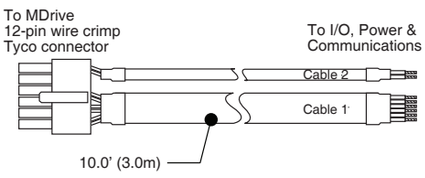
Electrically isolated in-line USB to SPI converter pre-wired with mating connector to conveniently program and set configuration parameters. A secondary cable from the mating connector provides interface to power and I/O.



Wire Colors	Function
Orange	Enable
Blue	Direction
White	Opto Ref
Green	Step Clock
Black	N/C
Red	N/C

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	N/C
Red	N/C
Uninsulated	Drain Wire

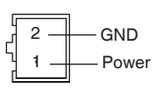
Mating Connector Kit p/n: CK-03

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

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

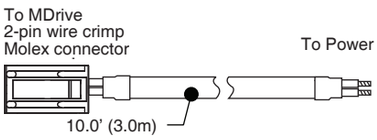
P3 Power

2-pin wire crimp



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

Function: Power Interface



Wire Colors	Function
Black	Power Ground
Red	+V

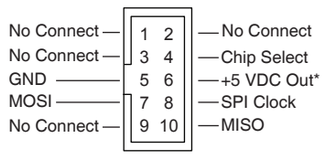
Mating Connector Kit p/n: CK-05

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

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

P2 Communications

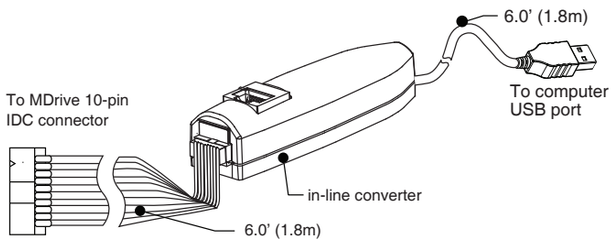
10-pin IDC



*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.



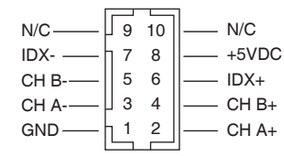
Mating Connector Kit p/n: CK-01

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

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

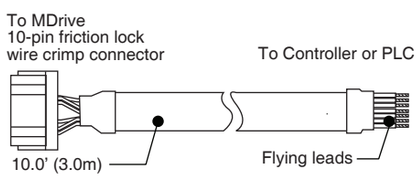
P4 Optional Internal Encoder

10-pin wire crimp



Prototype Development Cable p/n: PD10-3400-FL3

Speed test and development with pre-wired mating connector.



Wire Colors	Function
White/Blue	Index +
Blue/White	Index -
White/Orange	CH B+
Orange/White	CH B-
White/Green	CH A+
Green/White	CH A-
White/Brown	GND
Brown/White	+5 VDC

Mating Connector Kit p/n: CK-02

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

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

