

4 Connection and interface

⚠ DANGER
EXPOSED SIGNALS
Hazardous voltage levels may be present if using an open frame power supply to power the product.
Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION
SWITCHING DC POWER/HOT PLUGGING
Do not connect or disconnect power, logic, or communications while the device is in a powered state.
Remove DC power by powering down at the AC side of the DC power supply.
Failure to follow these instructions can result in equipment damage.

4.1 Interfacing communications



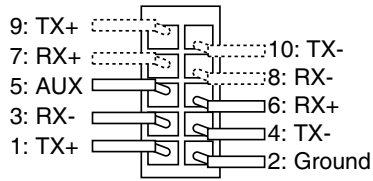
RS-422/435 communications is interfaced using the following connector:

1. 10-pin wire crimp connector at P2

For general RS-422/485 communications methods and practices please see Part 1, Section 5 of this document.

4.1.1 P2 — 10-pin friction lock wire crimp

----- Use to connect second device



Pin #	Function	Description
1	TX +	Transmit plus
2	Comm GND	Communications ground only.
3	RX -	Receive minus
4	TX -	Transmit minus
5	Comm GND	Communications ground only.
6	RX +	Receive plus
7	RX +	Receive plus
8	RX -	Receive minus
9	TX +	Transmit plus
10	TX -	Transmit minus

Table 4.1 P2 communications, 10-pin locking wire crimp


Connectivity accessories

Mating connector kitCK-02
(contains 5 connector shells, ribbon cable not included)

Communications converter cable (10'/3.0 m).....MD-CC402-001

4.2 Interfacing DC power

See part 1 of this document, section 3, for recommended power cable configurations.

 **CAUTION**

OVER VOLTAGE

The DC voltage range for the MDrive 23 Hybrid is +12 to +60 VDC

. Ensure that motor back EMF is factored into your power supply size calculations.

Allow 3.0 A maximum power supply output current per MDrive-23Plus in the system. Actual power supply current will depend on voltage and load.

Failure to follow these instructions can result in equipment damage.

4.2.1 Recommended power supply characteristics

	+12 to +60 VDC
Type	Unregulated linear
Ripple	± 5%
	3.5 A (per MDrive 23)

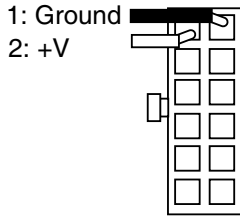
Table 4.2 Recommended power supply characteristics

4.2.2 Recommended wire gauge

Cable Length: Feet (meters)	10 (3.0)	25 (7.6)	50 (15.2)	75 (22.9)	100 (30.5)
Amps Peak	Minimum AWG				
1 Amp Peak	20	20	18	18	18
2 Amps Peak	20	18	16	14	14
3 Amps Peak	18	16	14	12	12

Table 4.3 Recommended power supply wire gauge

4.2.3 P1 — 12-pin locking wire crimp interface



Pin #	Signal	IMS cable wire colors
		PD12-1434-FL3
1	Power ground	Black
2	Motor power supply	Red

Table 4.4 Power and ground connections, 12-pin locking wire crimp

Connectivity accessories

Mating connector kitCK-03
(contains 5 connector shells and the appropriate quantity of pins to make 5 cables)

Prototype development cable (10'/3.0 m)..... PD12-1434-FL3

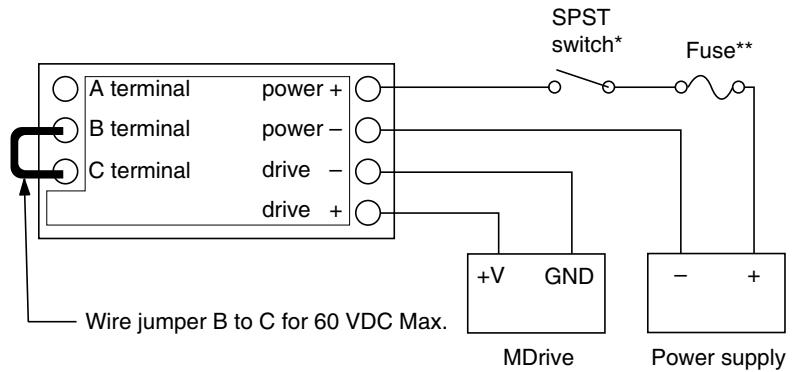
Manufacturer (Tyco) part numbers

Connector shell.....1-794617-2

Pins.....794610-1

4.2.4 Power Interface using Drive Protection Module DPM75

The DPM75 Drive Protection Module will limit surge currents for one (1) MDrive 23 Hybrid at up to 60 VDC to allow switching DC Power.



* Do not switch negative side of supply

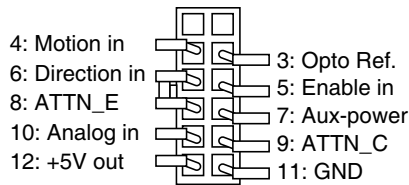
**Fuse = 6.3 Amp slow blow (recommended: Bussman S505-6.3A or Littelfuse 215006.3). The fuse is optional.

Figure 4.1 DPM75 Drive Protection Module

4.3 Interfacing Logic and I/O

See part 1 of this document, section 6, for logic interface configurations and methods.

4.3.1 P1 — 12-pin locking wire crimp



Pin #	Signal	
		PD12-1434-FL3
3	Opto reference	White/blue
4	Motion input	Blue/white
5	Enable input	White/orange
6	Direction input	Orange/white
7	Aux-Power	White/brown
8	Attention output - emitter	White/green
9	Attention output - collector	Green/white
10	Analog input	White/gray
11	Analog input ground	Gray/white
12	+5 VDC output	Brown/white

Table 4.5 Universal input connections, 12-pin locking wire crimp

Connectivity accessories

Mating connector kit CK-03
 (contains 5 connector shells and the appropriate quantity of pins to make 5 cables)

Prototype development cable (10'/3.0 m)..... PD12-1434-FL3

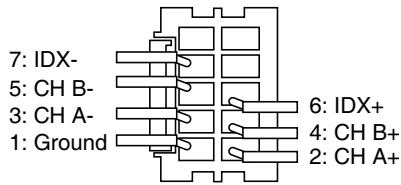
Manufacturer (Tyco) part numbers

Connector shell..... 1-794617-2

Pins..... 794610-1

4.4 Encoder interface

4.4.1 P4 — 10-pin wire crimp



Pin #	Signal	IMS cable wire color
		ED-CABLE-JST10
1	GND	White/Brown
2	CH A+	White/green
3	CH A-	Green/white
4	CH B+	White/orange
5	CH B-	Orange/white
6	IDX+	White/blue
7	IDX-	Blue/white
8	No Connect	Brown/white

Table 4.6 P4 - Encoder interface

4.5 Connectivity accessory details

4.5.1 USB to 10-pin wire crimp connector P2 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

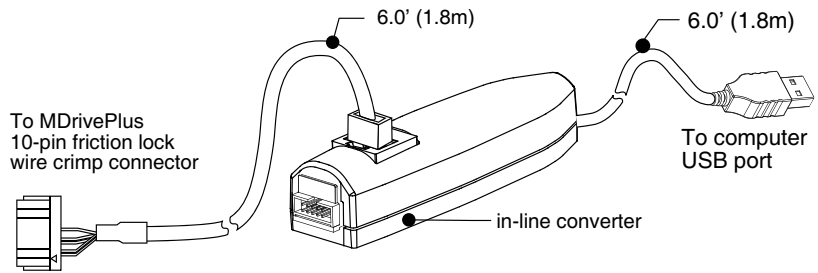
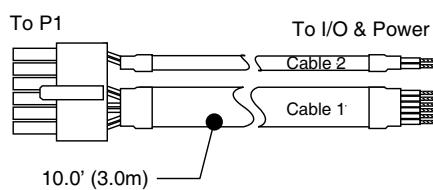


Figure 4.2 MD-CC402-001 communications converter cable

4.6.2 P1 — 12-pin locking wire crimp PD12-1434-FL3

The PD12-1434-FL3 prototype development cable is used to rapidly interface the MDrive to the users power, communications and logic interface. This 10' (3.0 m) cable consists of a 12-pin locking wire crimp connector to plug directly into the MDrive P1 connector with flying leads on the opposite end to interface to power, communications and logic.

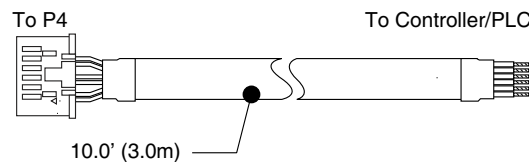


Wire Colors	Function
Gray/White	Analog ground
White/Gray	Analog input
White/Brown	Aux power
Brown/White	+5V output
White/Green	Attn out (e)
Green/White	Attn out (c)
White/Orange	Enable
Orange/White	Direction
White/Blue	Opto Ref
Blue/White	Motion
Black	Power Gnd
Red	+V
Uninsulated	Drain Wire

Figure 4.5 Prototype development cable PD12-1434-FL3

4.6.3 P4 — 10-pin wire crimp ED-CABLE-JST10

The ED-CABLE-JST10 prototype development cable is used to rapidly interface the MDrive optional encoder interface to the users controller. This 10' (3.0 m) cable consists of a 10-pin locking wire crimp connector to plug directly into the MDrive optional P4 connector with flying leads on the opposite end to interface a control device.



Pair	Wire Colors	Function
1	White/Blue	IDX+
	Blue/White	IDX-
2	White/Orange	CH B+
	Orange/White	CH B-
3	White/Green	CH A+
	Green/White	CH A-
4	White/Brown	Ground
	Brown/White	N/C

Figure 4.6 Encoder interface cable ED-CABLE-JST10

4.7 Mating connector kits

Use to build your own cables. Kit contains 5 mating shells with pins. Cable not supplied. Manufacturer's crimp tool recommended.

Mates to connector:

- P2 10-pin IDC CK-01
- P1 12-pin wire crimp CK-03
- P4 10-pin wire crimp (encoder) CK-13