

# PANTHER HI & HE

HIGH PERFORMANCE MICROSTEPPING SYSTEM

## QUICK REFERENCE



### Panther HI And Panther HE Quick Reference

The primary function of Panther HI & HE Quick Reference Guide is to acquaint the user with the specifications, basic wiring and configuration of the Panther HI & HE Microstepping Drivers. The full product manual is available in Acrobat PDF format on the IMS Product CD, shipped with the product. It also may be downloaded from the IMS web site at <http://www.imshome.com>.

### Notes And Warnings

Please observe the following when handling, connecting and using your Panther HI & HE Drivers. Failure to observe these points may result in damage to the drive. All warranty and disclaimer information is located in the full product manual on the CD and should be referenced for more information.



**WARNING!** The Panther HI & HE Driver components are sensitive to Electrostatic Discharge (ESD). All handling should be done at an ESD protected workstation.



**WARNING!** Hazardous Voltage Levels are present.

### Operating Characteristics

Isolated Logic Inputs ..... Limit A, Limit B, Home, Party  
 Baud Rate ..... 9600  
 Motor Speed (1.8° Step) ..... 0 to 6000 RPM  
 Motor Resolutions (1.8°/Step) ... Auto-Variable 200, 400, 800, 1600,  
 3200, 6400, 12800, 25600, 51200  
 Position Counter ..... ± 8,388,607.99  
 Nonvolatile Memory ..... 2k Bytes  
 Inputs (General Purpose) ..... 3 (0 to +5 VDC)  
 Inputs (Dedicated) ..... 5 (0 to +15 VDC)  
 Outputs (General Purpose) ..... 3 (0 to +5 VDC)  
 Encoder Resolution ..... 50 - 12750 (In 50 Line Increments)  
 Status Indicators ..... Power, Fault  
 Protection ..... Thermal and All Way Short Circuit  
 Internal Fuse ..... 5mm, 250 volt, 2 Amp Slow Blow

### Thermal Specifications

Operating Temperature ..... 0 to +50° C  
 Storage Temperature ..... -40° to 125° C  
 Case Temperature (Max) ..... +60° C

### Electrical Specifications

	MIN	TYP	MAX	UNITS
Input Voltage	90		128	VAC
Optional	180		264	VAC
Phase Output Current (RMS)	2		7	A
Phase Output Current (Peak)			10	A
Input Forward Current (Isolated Inputs)				
Step Clock, Direction, Enable, Reset	7.0		15	mA
Input Forward Voltage	1.5		1.7	V
Input Reverse Breakdown Voltage	5			V
Input Voltage (Dedicated Logic Inputs)	0		15	V
Input Voltage (General Purpose Inputs)	0		5	V
Output Current (General Purpose Outputs)			15	mA
Collector-Emitter Voltage (Fault Output)			140	V
Collector-Emitter Saturation Voltage				
Fault Output (I <sub>CS</sub> = 25 mA DC)			0.2	V

All values taken at 25° C, at 120 VAC.  
 NOTE: The aluminum housing is electrically isolated.

### Connector P1

Pin #	Pin Name	Function
1	Phase A	Phase A Motor Connection
2	Phase /A	Phase /A Motor Connection
3	Phase B	Phase B Motor Connection
4	Phase /B	Phase /B Motor Connection
5	AC Input Neutral	Neutral connection of the AC power
6	AC Input Line	Line (hot) connection of the AC power.



**WARNING!** Follow the correct polarity of the AC Input to prevent damage.

### Connector P2

Pin #	Pin Name	Function
1	TX -	RS422/485 Transmit -, (data out from Indexer).
2	TX +	RS422/485 Transmit + (data out from Indexer).
3	RX -	RS422/485 Receive -, (data into Indexer).
4	RX +	RS422/485 Receive + (data into Indexer).
5	Limit A	Optically isolated, active low limit switch Input for "+" direction.
6	Party	Optically isolated party mode select pin: 0 = Party, 1 (Floating) = Single.
7	Limit B	Optically isolated, active low limit switch input for "-" direction.
8	Home	Optically isolated, active low Home switch input.
9	Opto Supply	DC bias for Input opto couplers. Internal current limiting resistors for +5VDC are supplied. User must connect resistors in series with optically isolated input signals for voltages greater than +5VDC.
10	Fault	High voltage open collector output indicating driver fault condition. This output will be active when the driver detects an internal fault such as overcurrent or phase short. This output must be pulled high externally. A reset or power down is required to clear the fault condition.
11	Ground	Logic Supply Ground connection.
12	GO	Active low level input to execute a program stored in NVM. Program execution begins at location 0 in memory. Internally pulled up to +5VDC through a 10kΩ resistor. Once executing, the GO input is ignored until the program completes or an Abort/Stop is executed.
13	Soft Stop	Active low input to stop indexing using deceleration ramp. Internally pulled up to +5VDC through a 10kΩ resistor.

### Connector P3

Pin #	Pin Name	Function
1	Input 3	User controlled input #3. Internally pulled up to +5VDC through a 10kΩ resistor.
2	Input 2	User controlled input #2. Internally pulled up to +5VDC through a 10kΩ resistor.
3	Input 1	User controlled input #1. Internally pulled up to +5VDC through a 10kΩ resistor.
4	+5VDC	Logic supply output for Encoder power.
5	Output 3	User controlled output #3. This is an open collector output with an internal 10kΩ pullup resistor to +5VDC.
6	Output 2	User controlled output #2. This is an open collector output with an internal 10kΩ pullup resistor to +5VDC
7	Output 1	User controlled output #1. This is an open collector output with an internal 10kΩ pullup resistor.
8	Moving	Moving output, low when indexing is in progress. High when not moving.
9	Jog +	Active low Jog input for "+" direction. Internally pulled up to +5VDC through a 10kΩ resistor.
10	Jog -	Active low Jog input for "-" direction. Internally pulled up to +5VDC through a 10kΩ resistor.
11*	Index -	Differential Encoder Index Mark + input.
12*	Index +	Encoder Index Mark Input. Internally pulled up to +5VDC through a 10kΩ resistor. (Differential Encoder Index Mark + Input).
13*	Channel A -	Differential Encoder Channel A - Input.
14*	Channel A +	Encoder Channel A Input. Internally pulled up to + 5VDC through a 10kΩ resistor/Differential Encoder Channel A + Input (with Differential Encoder Option installed).
15*	Channel B -	Differential Encoder Channel B - Input.
16*	Channel B +	Encoder channel B input. Internally pulled up to + 5VDC through a 10kΩ resistor/Differential Encoder Channel B + input (with Differential Encoder Option installed).

\* For HE Models only.

### Connector P4† (Optional RS232)

*Pin #	Function
2	Transmit Data (RS232)
3	Receive Data (RS232)
5	Ground (RS232)
9	+5 VDC (For Hand Held Terminal)

\* Pin numbers not shown are not used.  
 † A connector is supplied with the optional RS232 Interface.

### Replacing The Internal Fuse

Remove the front panel.  
 Remove the four allen head screws on the side of the unit.  
 Carefully slide the printed circuit board out about two inches.  
 The fuse is located behind the P1 connector.

NOTE: Under normal operating conditions it should not be necessary to replace the fuse. If the unit operates incorrectly or there is no power indicated, the unit should be returned to the factory for service.

### Graphical User Interface (GUI)

The Panther HI/HE Models are supplied with the QuickSTART I Motor Control Program. You may also use IMS Terminal which can be found on the IMS CD or at <http://www.imshome.com>.

## Output And Hold Current Adjust

### Determining the Output Current

The Output Current must be determined relative to the Phase Current of the motor you are going to use. Please see Page 8 of the Panther HI & HE Manual for details.

### Setting the Output Current

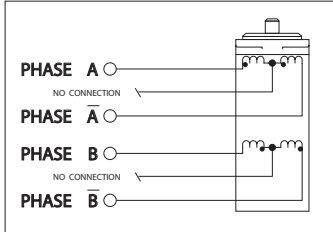
The Output Current and the Hold Current on the Panther LI & LE are adjusted by an on-board digital potentiometer.

Please refer to the Software Reference Manual available on the IMS CD or at <http://www.imshome.com>.

## Motor Connections

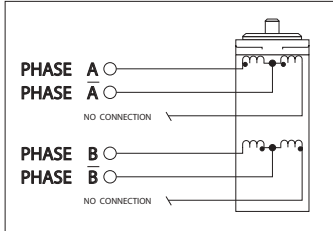
### 6 Lead Motors

#### Full Coil Configuration



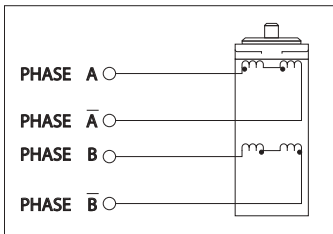
$$\text{Motor Peak Current} = \text{Rated Amps/Phase}$$

#### Half Coil Configuration



$$\text{Motor Peak Current} = \text{Rated Amps/Phase} \times 1.4$$

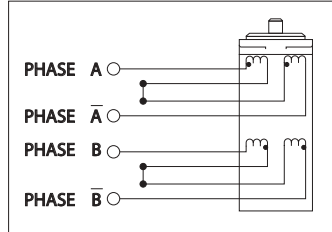
### 4 Lead Motors



$$\text{Motor Peak Current} = \text{Rated Amps/Phase} \times 1.4$$

### 8 Lead Motors

#### Series Connection

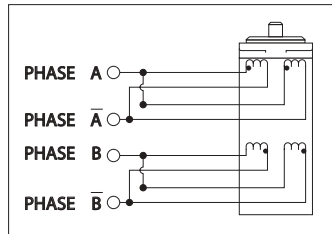


$$\text{Motor Peak Current} = \text{Rated Amps/Phase}$$

or

$$\text{Motor Peak Current} = \text{Bipolar Current Rating} \times 1.4$$

#### Parallel Connection



$$\text{Motor Peak Current} = \text{Rated Amps/Phase} \times 2$$

or

$$\text{Motor Peak Current} = \text{Bipolar Current Rating} \times 1.4$$

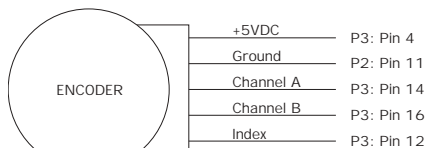
**MAXIMUM**  
Motor Inductance (mH/Phase) =  
 $0.2 \times \text{Minimum Supply Voltage}$



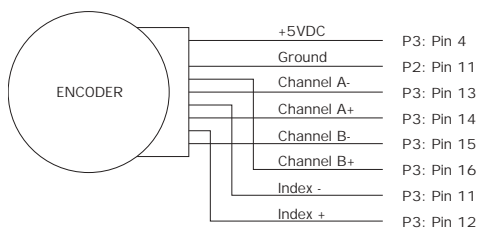
**WARNING!** Do not connect or disconnect the motor leads or the AC power leads with the power applied!

## Encoder Interface

An encoder with TTL level outputs is required to interface with the Panther HE Driver. On board 10KΩ pullups are provided so that encoders with open collector outputs can be used.



PANTHER HE Single Ended Encoder Interface



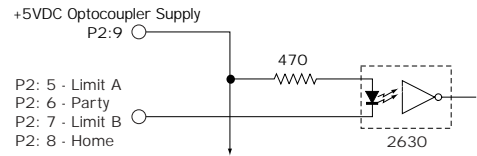
PANTHER HE-HE Differential Encoder Interface

For More Information:  
See the complete Panther HI/HE Product Manual

## Inputs And Outputs

### Optically Isolated Inputs

Limit A, Limit B, Home and Party. See the "Pin Descriptions, Connector P2" table for a description.



**WARNING!** If using a voltage other than +5VDC, the current through the Optocoupler must not exceed the maximum limit.

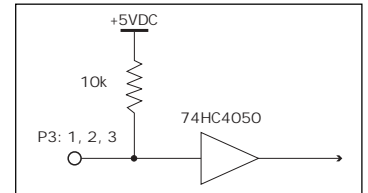
The Isolated Inputs may be powered by a DC voltage other than +5VDC. In doing so, care must be taken to limit this current. An external resistor must be placed in series with the Input Pins. The value of the resistor is to be calculated such that the input current is equal to the specified value of 7.0 to 15 mA.

### General Purpose Inputs and Outputs

The Panther HI & HE Drivers have three General Purpose Inputs and three General Purpose Outputs.

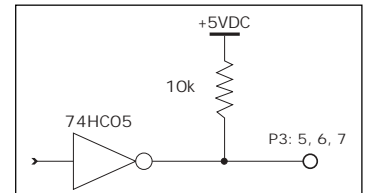
#### General Inputs

The Inputs are TTL compatible and are pulled up through a 10KΩ resistor to +5V on the Input.



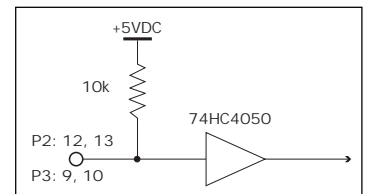
#### General Outputs

The Outputs are TTL compatible open collector type and are also pulled to +5V through a 10KΩ resistor.



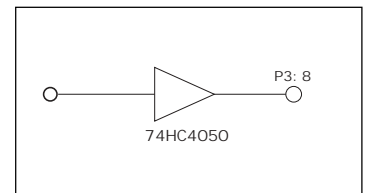
#### Dedicated Inputs

The Panther LI & LE Drivers have four dedicated inputs. They are: Go; Soft Stop; Jog +; and Jog -. The Inputs are pulled up to +5V through a 10KΩ resistor.



#### Moving Output

The Moving Output is used to indicate when the motor is in motion. When LOW, the indexer is stepping the motor in either direction. When HIGH, the motor is at rest.



## Mechanical Specifications

Dimensions in Inches (mm)

