IMS™ INTELLIGENT MOTION SYSTEMS, INC.
Excellence in Motion™

IB462He

ULTRAMINIATURE BIPOLAR STEPPING MOTOR DRIVER

RoHS

QUICK REFERENCE

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The Product Manual

The IB462He Product Manual contains full details about the product and associated Interface Boards, the INT-462 and the OSC-462H, and should be referenced prior to product use. These are available on the CD which shipped with your product and from the IMS web site at http://www.imshome.com.

Notes and Warnings

The IB462He, INT-462 and OSC-426H are sensitive to Electrostatic Discharge (ESD).

Do not apply power to the IB462He without proper heat sinking or cooling. The max. rear plate temperature is 70°C!

Hazardous Voltage Levels may be present if using an open frame power supply to power the IB462He, INT-462 or OSC-462H.

The rear mounting surface of the driver contains various voltages and must be kept isolated when attached to a conductive surface!

The Power Supply output voltage must not exceed the maximum input voltage of the IB462He,INT-462 or OSC-462H.

Do not "Hot Plug" Power or Motor Connection while power is applied to any of the IB462He drivers or accesories.

General Specifications

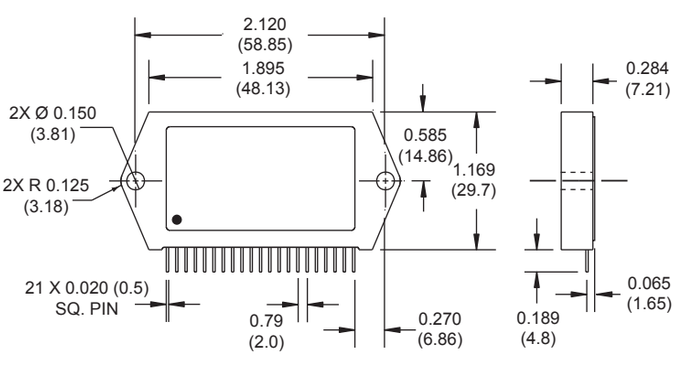
Electrical Specifications	Condition	Min	Typ	Max	Unit
Input Voltage Range	—	+12	—	+48	VDC
Phase Output Current	Per Phase	0.1	—	2	A
Quiescent Current (+V)	Outputs Floating	—	—	4	mA
Quiescent Current (+5V Input)	Outputs Floating	—	50	80	mA
Current Adjust Input Voltage	—	—	—	1.0	VDC

Logic Specifications	Condition	Min	Typ	Max	Unit
Low-Level Input Voltage	SCLK, DIR, H/F, Reset	—	—	0.6	VDC
Low-Level Input Voltage	Enable Input	—	—	1.3	VDC
High-Level Input Voltage	All Inputs	2	—	5	VDC
Low-Level Input Current	SCLK, DIR, H/F, Enable	—	—	-1.2	mA
Low-Level Input Current	Reset Input Only	—	—	-200	µA
High Level Input Current	SCLK, DIR, H/F, Enable	—	—	10	µA
Input Pull-up Resistance	SCLK, DIR, H/F, Enable	4.5	4.7	4.9	kΩ
Input Pull-up Resistance	Reset Input Only	50	51	52	kΩ

Thermal Specifications	Min	Typ	Max	Unit
Ambient Temperature	0	—	+50	°C
Storage Temperature	-40	—	+125	°C
Plate Temperature (Add't Cooling Req'd)	—	—	+70	°C

IB462He Mechanical Specifications

Dimensions in Inches (mm)



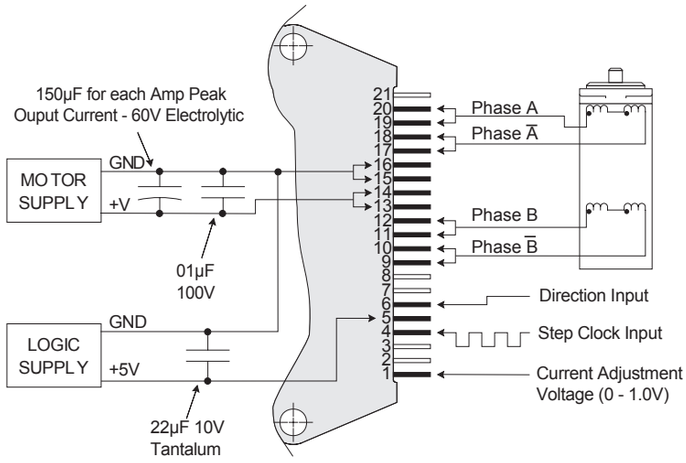
For More Information:
See the complete IB462He Product Manual
on the IMS Product CD or at www.imshome.com

IB462He Pin Configuration

Pin #	Function
1	Phase Current Adjustment
2	Reset Input
3	Half/Full Step Input
4	Step Clock Input
5	+5 VDC Logic Supply Input
6	CW/CCW Direction Input
7	Phase Enable Input
8	Phase B Current Sense Input
9	Phase B̄ Step Motor Output
10	

Pin #	Function
11	Phase B Step Motor Output
12	
13	+12 to +48 VDC Motor Power Supply Input
14	
15	Power Supply Return (Ground)
16	
17	Phase Ā Step Motor Output
18	
19	Phase A Step Motor Output
20	
21	Phase A Current Sense Input

Minimum Required Connections



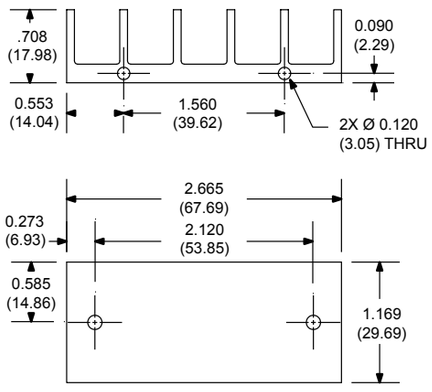
IB462He Mounting Requirements

The IB462H is designed to be socketed or soldered into a PCB. For PCB layout information and circuit board hole pattern please refer to the IB462He Manual, Section 1.7. This part of the Quick Reference only supplies Mechanical Mounting information.

Heat sinking and the use of the included insulating thermal pad are **ABSOLUTELY REQUIRED** for the IB462He driver at all power levels. Below are some examples of mounting configurations.

H-462H Heat Sink Kit Information

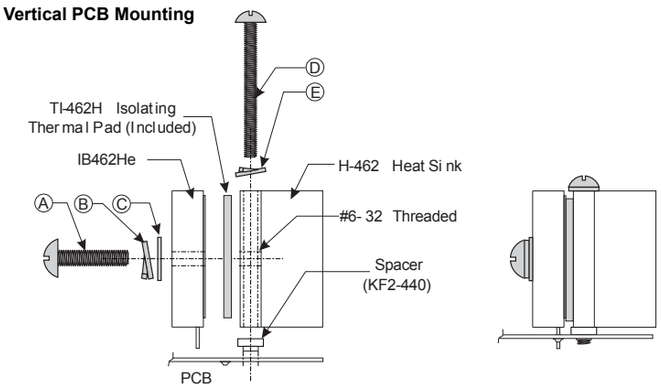
Heat Sink Dimensions



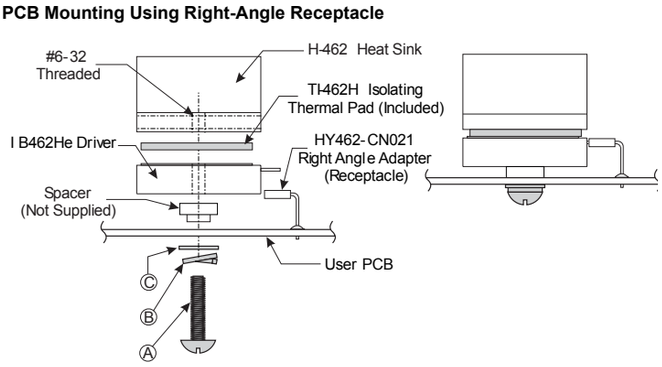
Heat Sink Kit Contents

1 - H-462 Heat Sink
Ⓓ 2 - 4-40 x 1.375 Scew
Ⓐ 2 - 6-32 x 5/8 Screw
2 - Spacers
Ⓔ 2 - #4 Split Washers
Ⓒ 2 - #6 Flat Washers
Ⓑ 2 - #6 Split Washers

Vertical PCB Mounting



PCB Mounting Using Right-Angle Receptacle



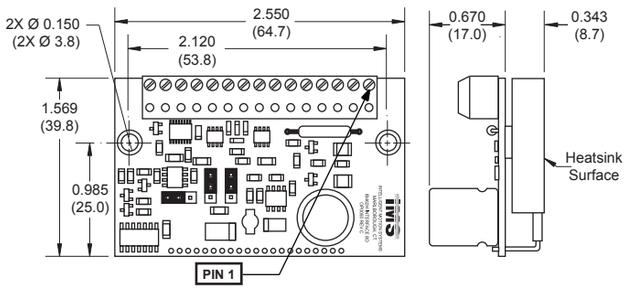
INT-462 Interface Board

General Specifications

Electrical Specifications	Condition	Min	Typ	Max	Unit
Input Voltage Range	—	+12	—	+48	VDC
Phase Output Current	Per Phase	0.1	—	2	A
Quiescent Current (Driver Connected)	Inputs/Outputs Floating	—	—	85	mA
Input Forward Current	Isolated Inputs	8	10	12	mA
Input Forward Voltage	Isolated Inputs	5	—	40	VDC
Signal Output Current	Fault Output	—	—	25	mA
Drain-Source Voltage	Fault Output	—	—	100	VDC
Drain-Source Resistance	Fault Output	—	6.5	—	Ω

INT-462 Mechanical Specifications

Dimensions in Inches (mm)



INT-462 Pin Configuration

Pin #	Function
1	Power Supply Return (Ground)
2	+V (+12 to +48 VDC)
3	Motor Phase A
4	Motor Phase $\overline{A}$
5	Motor Phase B
6	Motor Phase $\overline{B}$
7	CW/CCW Direction Input (Isolated)

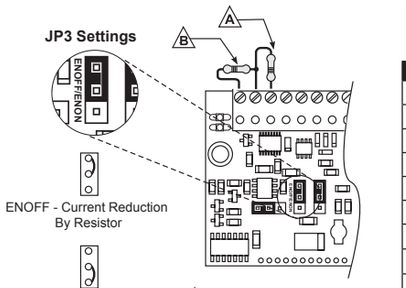
Pin #	Function
8	Step Clock Input (Isolated)
9	+5 to +40 VDC Optocoupler Supply
10	Enable Input (Isolated)
11	Reset Input (Isolated)
12	Fault Output (Open-Collector)
13	Logic Ground
14	Current Adjustment
15	Current Reduction Adjustment

Mounting

Refer to the mounting instructions on the opposite side of this sheet or in the full product manual Section 2.1.

Setting Run and Hold Output Current

A current adjustment resistor is **REQUIRED.**

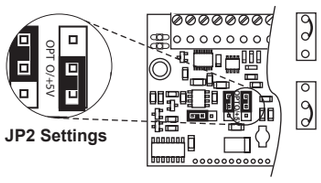


Current Adjustment Resistor Values (Resistor Required)

I_{Run} (A)	1% Ω	I_{Run} (A)	1% Ω
0.1	49	1.1	549
0.2	100	1.2	604
0.3	150	1.3	649
0.4	200	1.4	698
0.5	249	1.5	750
0.6	301	1.6	806
0.7	348	1.7	845
0.8	402	1.8	909
0.9	453	1.9	953
1.0	499	2.0	1000

$$R_{RED} = 500 \times \left(\frac{I_{RUN} \times I_{HOLD}}{I_{RUN} - I_{HOLD}} \right)$$

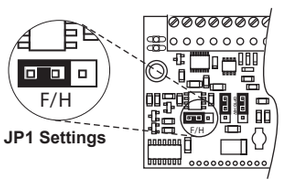
Opto-Isolated Input Power Setup



OPTO - Optos Powered by External +5 to +24 VDC Supply (Sinking Inputs, Isolated)

+5V - Optos Powered by on-board +5V (Sinking Inputs, Non-Isolated)

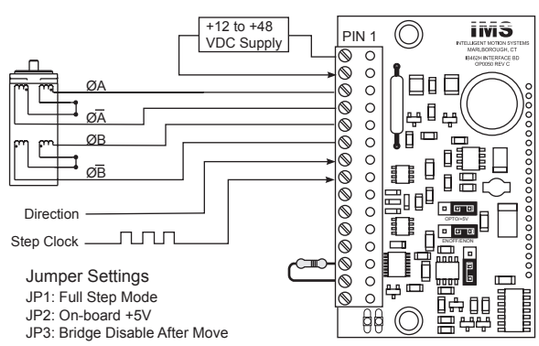
Setting Half/Full Step Modes



F - Full Step Mode

H - Half Step Mode

Minimum Required Connections



OSC-462H Variable Speed Control Board

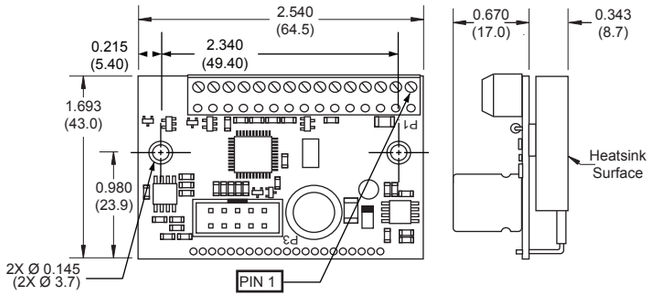
General Specifications

Electrical Specifications	Condition	Min	Typ	Max	Unit
Input Voltage Range	—	+12	—	+48	VDC
Phase Output Current	Per Phase	0.1	—	2	A
Quiescent Current (Driver Connected)	Inputs/Outputs Floating	—	—	85	mA
Low-Level Input Voltage	Stop/Start, DIR, SCLK	-0.5	—	1.5	VDC
High-Level Input Voltage		3.0	—	5.5	VDC
Low-Level Input Voltage	Enable Input Only	0.5	—	1.65	VDC
High-Level Input Voltage		3.85	—	5.5	mA
Output Drain-Source Voltage	Direction and Step Clock Outputs	—	—	80	V
Output Drain-Source Current		—	—	120	mA
Output Drain-Source On-Resistance		—	—	6	Ω

Speed Control Specifications	Min	Typ	Max	Unit
Speed Control Input Voltage	0	—	+5	V
A/D Resolution	—	10	—	bit
Speed Control Potentiometer Resistance	—	10	—	kΩ

OSC-462H Mechanical Specifications

Dimensions in Inches (mm)



OSC-462H Pin Configuration

Pin #	Function
1	Phase A Step Motor Output
2	Phase $\overline{A}$ Step Motor Output
3	+V (+12 to +48 VDC)
4	Power Supply Return (Ground)
5	Phase B Step Motor Output
6	Phase $\overline{B}$ Step Motor Output
7	+5V Out (Potentiometer +)

Pin #	Function
8	Logic Ground (Potentiometer -)
9	Speed Control In (Potentiometer Wiper)
10	Enable Input (HIGH, Disconnected=Enabled)
11	Step Clock Input
12	Direction Input
13	Stop/$\overline{\text{Start}}$ Input
14	Buffered Step Clock Output
15	Buffered Direction Output

Mounting

Refer to the mounting instructions on the opposite side of this sheet or in the full product manual Section 2.2.

Parameter Setup

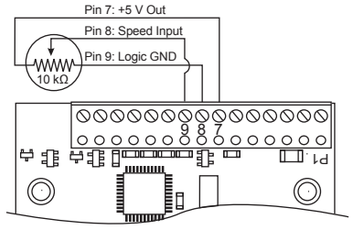
Parameter setup is accomplished in software using SPI (Serial Peripheral Interface) IMS recommends the MD-CC300-000 USB to SPI converter/cable and the IMS Motor Interface GUI to configure the parameters. This free software tool is on the IMS CD and also available from the web at http://www.imshome.com. While the available parameters are listed below, the device my be operated without changing the parameters from the factory default.

The SPI Cable plugs into Connector P3, a 10-Pin IDC Style connector located on the board.

Param	Function
ACCL	Acceleration
C	Joystick Center
DB	Potentiometer/Joystick Deadband
FS	Potentiometer/Joystick Full Scale
MHC	Motor Holding Current

Param	Function
MRC	Motor Run Current
RANGE	Max/Initial Velocity Range
STEP	Half or Full Step Mode
VI	Initial Velocity
VM	Max Velocity

Speed Control Connection



The Analog Speed Control Input may be connected on any device with a 0 to +5 VDC output such as a sensor

Minimum Required Connections

For connection of other Inputs/Outputs please refer to the IB462He product manual Section 2.2.