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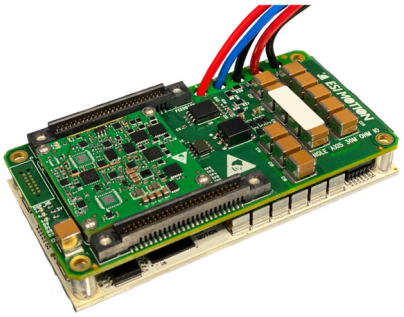
www.esimotion.com Product of USA

Beetle

Single-Axis Servo Drive Module

20 Amps, 300 VDC, Versatile



Introducing Beetle, our cutting-edge versatile servo drive module, meticulously engineered to meet the demanding requirements of both defense and commercial applications. Designed for exceptional performance and reliability, this state-of-the-art module offers seamless integration into a wide range of systems, ensuring precise control and adaptability in even the most challenging environments. The versatile controller is ideal for high power **Aircraft**, **Ground** and **Sea/Subsea systems** where size and weight are at a premium, especially for **Unmanned Systems**. It is a great fit in specialized military industrial, and commercial applications that require operating at high temperatures, in high vibration, or other extreme environmental conditions. This High-Power Servo Drive Module can drive motors and can be integrated into many systems and applications. The Beetle incorporates a dual board stack that offers several feedback options, and incorporated I/O Board setup. Whether deployed in rugged military vehicles or sophisticated industrial machinery, our servo drive module delivers unmatched efficiency, durability, and versatility, making it the ideal solution for mission-critical operations and high-performance commercial uses alike.

Features

- Fully Digital High-Performance Drive
- Multiple Feedbacks Supported:
  - BiSS-C (Unidirectional)
  - Quadrature Encoder
  - Resolver
  - Hall
  - Sensorless
- Torque, Velocity, or Position control
- Brake drivers
- 40 kHz PWM Frequency Offered Standard (Consult factory for PWM frequencies up to 100 kHz)
- Communication Interfaces
  - CAN
  - RS-422
- Includes configurable, user-friendly GUI with enhanced data collection capability and integrated oscilloscope

Specifications

- Nominal Voltage: 300VDC
  - 600V/900V Options available upon request
- Maximum Continuous Output Current: 20A
- Max Output Power: 6 kW
- Operating Temperature: - 40°C to 71°C
- Weight: 181.4 g (6.4 oz)
- Size: 96.5 mm x 50.5 mm x 25.4 mm (3.80” x 1.99” x 1.00”)

Compliance

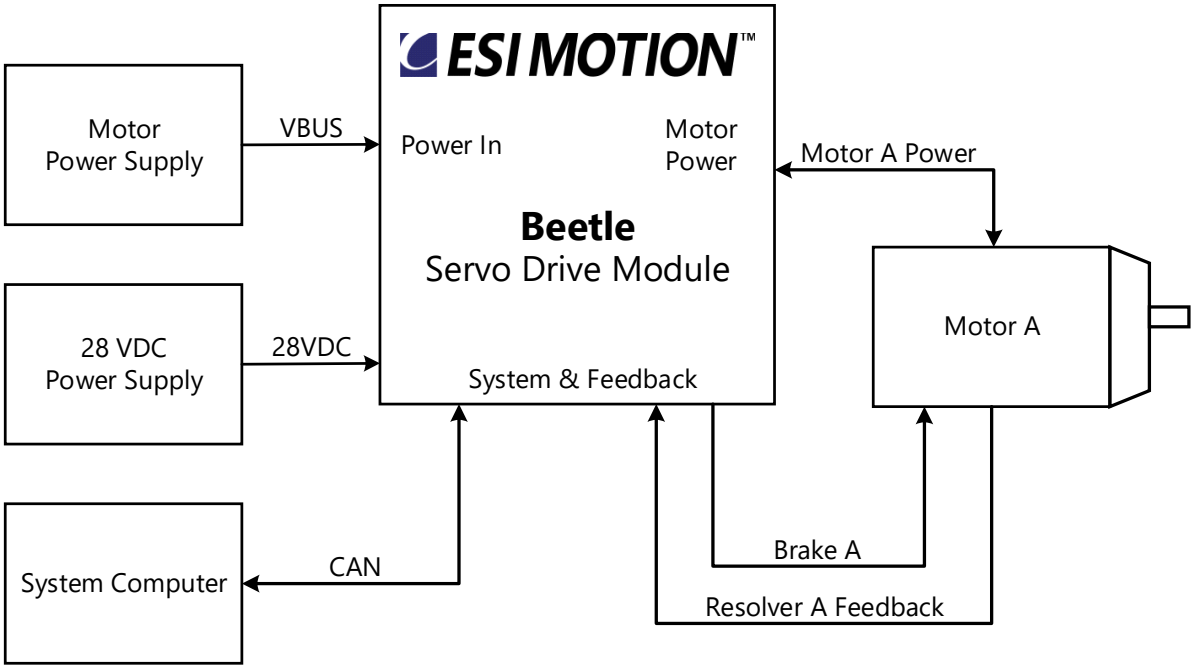
- Shock/Vibration per MIL-STD-810G:
  - Random Vibration 514.7 Category: 16.3 Grms, 15 – 2,000 Hz (0.20 g2/Hz)
  - Shock 516.7 Procedure 1: 40G Terminal Peak Sawtooth, 11ms
- Optional Software design assurance: DO-178C

Customization Available

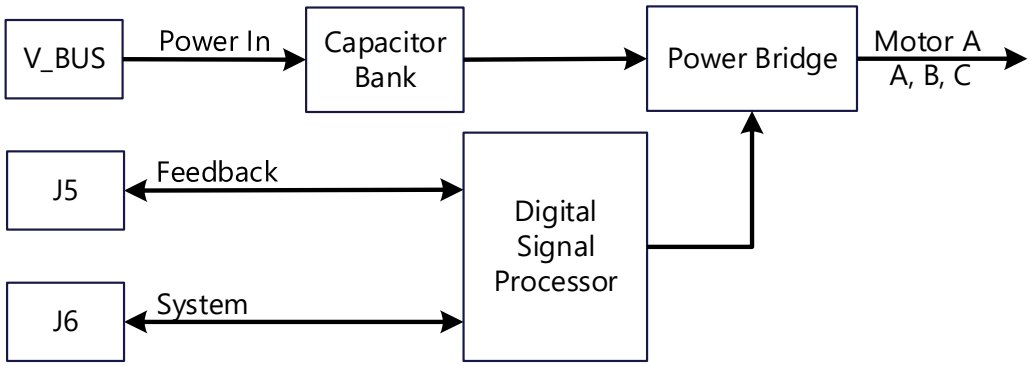
ESI Motion has the expertise to customize a solution for your project’s needs.

Contact us today at sales@esimotion.com to see how we can tailor a solution for you.

Typical Beetle Application:



Beetle Block Diagram:



Electrical Specifications

Absolute Maximum Values

The values in the table below should never be exceeded as permanent damage to the controller may result.

PARAMETER		ABSOLUTE MAXIMUM	UNIT
V_BUS (Motor Power)		450	VDC
28VDC_IN (Logic Power)		50	VDC
±10 Volt Analog Inputs		±22	V
±5 Volt Analog Inputs (Resolver Inputs)		±22	V
Single Ended Analog Input		±22	V
Open Collector Inputs (Hall Inputs)		±22	V
CAN SIGNALS	Differential (CAN+ – CAN-)	±27	V
	Common-Mode	±27	V
RS-422 Inputs		±14	V
Differential Digital Inputs (Encoder and BiSS-C Inputs)	Differential (Assumes 50% Duty Cycle)	7.6	V
	Common-mode	±7.0	V
Digital Input		+4.6	V
Temperature Sensor Input		-3 to +6	V
Operating Baseplate Temperature		-40 to +71	°C
Storage Temperature		-55 to +100	°C

Recommended Operating Conditions

DC INPUT CHARACTERISTICS				
PARAMETER	**MIN**	**NOM**	**MAX**	**UNIT**
V_BUS (Motor Power)	22	300	400	VDC
V_BUS (Motor Power) Input Current			20	A
V_BUS (Motor Power) Input Power		6.0	8.0	kW
Internal Bus Capacitance (Differential Mode)		25		µF
Chassis Capacitance (Common Mode) (1)		2.5		µF
28VDC_IN (Logic Power)	22	28	36	VDC
28VDC_IN (Logic Power) Operating Current w/o Brakes			0.75	A
28VDC_IN (Logic Power) Operating Current			4.25	A

Notes:

1. Total for V_BUS and V_BUS_RTN.

Motor Power Output Characteristics			
PARAMETER (Per Axis)	**Continuous**	**Peak (1)**	**Units**
Output current, 20A Model	20	40	Amps Peak-of-Sin
Output current, 10A Model	10	20	Amps Peak-of-Sin
Output current, 5A Model	5	10	Amps Peak-of-Sin

Notes:

1. Two Second Peak

I/O Characteristics				
PARAMETER	**MIN**	**NOM**	**MAX**	**UNIT**
±10 Volt Analog Inputs ANALOG_IN_1, ANALOG_IN_2				
Input Range	-10		+10	V
Common Mode Input Range	-8.0	0	+10.0	V
Impedance		20.0		kΩ
Input Bandwidth		100		kHz
Analog Output ANALOG_OUT_1, ANALOG_OUT_2				
Output Range	-3		+3	V
Analog Output Impedance		50		Ω
Update Rate		2X		PWM Frequency
Brake BRAKE+MA, BRAKE-MA, BRAKE+MB, BRAKE-MB				
Output Voltage		98%		Percent of 28VDC_IN
Output Current Limit	1.3	1.4	1.5	Amps
CAN Signals CAN+, CAN-				
Voltage Levels	Compliant to ISO 11898-2			
Standard Bit Rates	100, 250, 500, and 1,000			Kbps
Encoder, Hall, BiSS-C, and Auxiliary Equipment Power Signals 5VDC_OUT, SIGNAL_GND				
Output Voltage	4.75	5.0	5.25	Volts
Output Current (Total for all 5VDC_OUT connections)			500	mA
Encoder and BiSS-C Signals A+MA, A-MA, B+MA, B-MA, I+MA, I-MA, A+MB, A-MB, B+MB, B-MB, I+MB, I-MB				
Voltage Levels	Compliant to EIA-422-B			
Differential Input Impedance		120		Ohms

I/O Characteristics				
PARAMETER	**MIN**	**NOM**	**MAX**	**UNIT**
Input Frequency			25	MHz
Encoder Power 5VDC_OUT				
Output Voltage	4.75	5.0	5.25	VDC
Output Current		500		mA
Motor Temperature MOTOR_TEMP+MA, MOTOR_TEMP-MA, MOTOR_TEMP+MB, MOTOR_TEMP-MB				
Thermistor Resistance at 25°C	1	5	10	kΩ
Recommended Thermistor	TDK/Epcos PN B57861S0502F040			
Excitation Voltage		3.0		V
Excitation Impedance		2.0		kΩ
Input Bandwidth		1.6		kHz
Open Collector Inputs (Hall Inputs) HALL_A_MA, HALL_B_MA, HALL_C_MA, HALL_A_MB, HALL_B_MB, HALL_C_MB Alternate Function Name DIGITAL_IN_1, DIGITAL_IN_2, DIGITAL_IN_3, DIGITAL_IN_4, DIGITAL_IN_5, DIGITAL_IN_6				
Input Voltage	0		10	V
Internal Pull Up Voltage	4.5	5.0	5.5	V
Internal Pull Up Impedance		1.0		kΩ
Logic High Voltage		1.95		V
Logic Low Voltage		1.07		V
Input Hysteresis		0.88		V
Resolver Excitation EXE+MA, EXE-MA, EXE+MB, EXE-MB				
Output Voltage	3.8	4	4.2	V_{RMS}
Resolver Excitation Output Frequency (1)		5.0		kHz
Resolver SIN, COS (ANALOG_IN_3 – ANALOG_IN_6) SIN+MA, SIN-MA, COS+MA, COS-MA, SIN+MB, SIN-MB, COS+MB, COS-MB Alternate Function Name ANALOG_IN_3+, ANALOG_IN_3-, ANALOG_IN_4+, ANALOG_IN_4-, ANALOG_IN_5+, ANALOG_IN_5-, ANALOG_IN_6+, ANALOG_IN_6-				
Differential Range	2		4.2	V_{RMS}
Differential Impedance		20		kΩ
Input Bandwidth		70		kHz
RS422 Signals RS422_TX, RS422_RX				
Voltage Levels	Compliant to EIA-422-B			

This document does not contain Technical Data or Technology as defined the ITAR Part 120.10 or EAR Part 772.

I/O Characteristics				
PARAMETER	**MIN**	**NOM**	**MAX**	**UNIT**
Standard Bit Rates		115.2, 230.4, 460.8, 1000		Kbps

Mechanical Specifications

Mechanical Specifications		
PARAMETER	**Value**	**UNIT**
Weight	181.4 (6.4)	g (oz)
Size	96.5 x 50.5 x 25.4 (3.8 x 1.99 x 1.0)	mm (in)

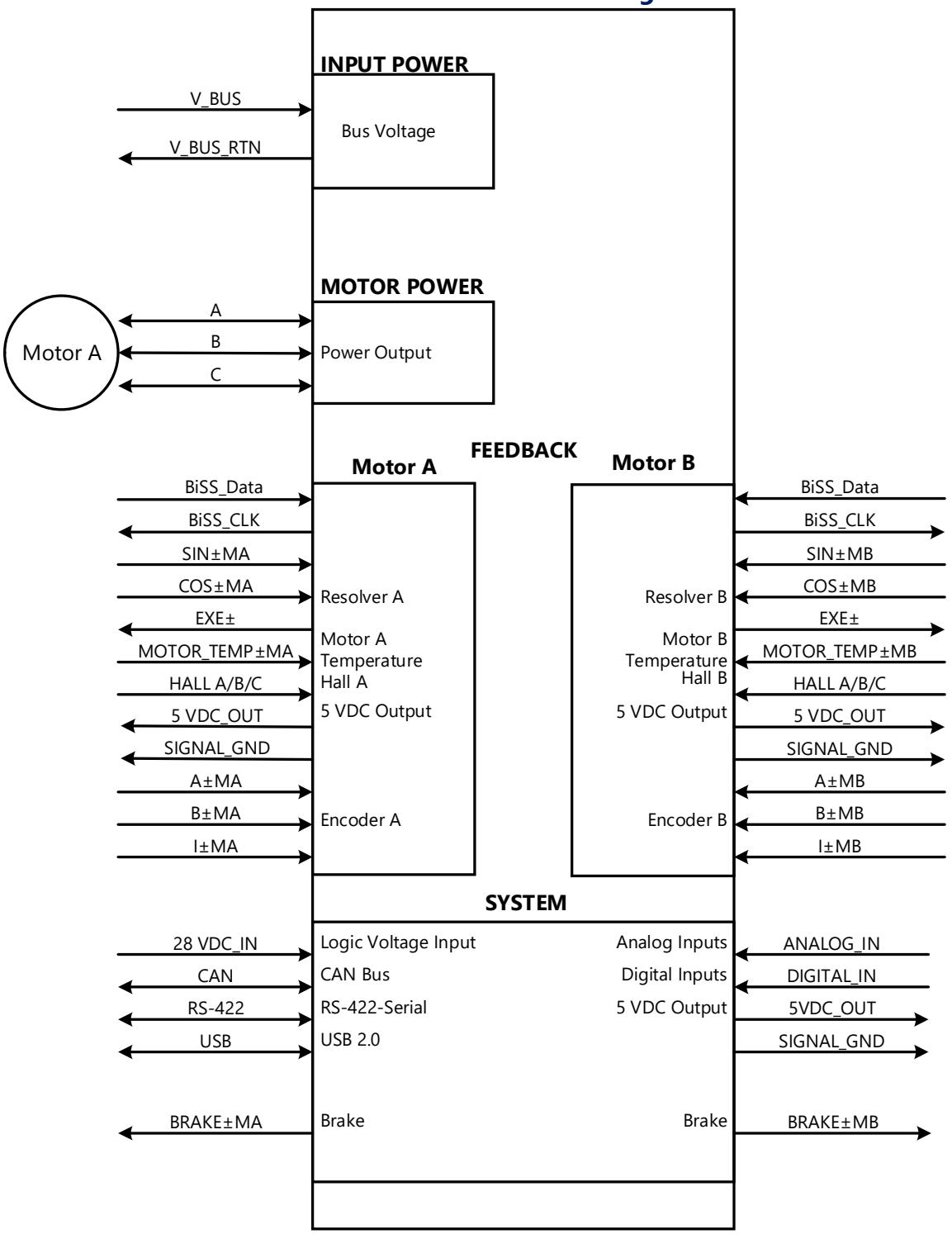
Wire Information

Ref	Description	Wire Size	Insulation	Color
A	Motor A Phase A	AWG 14	PTFE (Teflon)	Black
B	Motor A Phase B	AWG 14	PTFE (Teflon)	Red
C	Motor A Phase C	AWG 14	PTFE (Teflon)	Blue
V_BUS	Motor Power	AWG 14	PTFE (Teflon)	Red
V_BUS_RTN	Motor Power Return	AWG 14	PTFE (Teflon)	Black

Connector Information

Ref	Function	Number of contacts	Connector Part Number	Mating Connector Part Number
J5	System Interface	50	TFM-125-02-L-D-DS	SFSDT-25-28-G-24.00-SS
J6	Feedback	50	TFM-125-02-L-D-DS	SFSDT-25-28-G-24.00-SS

Beetle Interconnect Diagram



Interfaces Description

Overview

The Beetle servo drive is a rugged servo controller with very high-power capability in a small size and low weight package. This section describes the Beetle electrical interfaces by functional group.

Power Input

Motor power (V_BUS) is supplied to the Beetle through the Power Input flying leads.

V_BUS Voltage is the high current input used for motor power. V_BUS is isolated from.

Motor Feedback (J5)

The motor feedback interface is connected to the Motor Feedback connector.

The **Beetle** servo drive supports the following motor feedback devices:

- Resolver
- Quadrature Encoder
- Hall
- BiSS-C
- Sensorless

Feedback options are software configurable via HiDS.

The connector provides connection for a motor thermistor. It is compatible with a negative temperature coefficient (NTC) thermistor. The temperature vs. resistance can be configured through software.

An auxiliary 5-volt power supply (5VDC_OUT) is provide to power encoders, hall sensors, or other 5-volt devices. Several 5VDC_OUT signals are provided for ease of connection to multiple devices. Internally, all of the 5VDC_OUT is connected together. The current rating for the 5VDC_OUT is the combined current of all of the 5VDC_OUT signals. The return signal for 5VDC_OUT is SIGNAL_GND.

System Interface (J6)

The connector provides user interface signals. This interface includes 28 VDC power input (28VDC_IN and 28VDC_RTN) to power the **Beetle**'s logic circuits. Do not connect the 28VDC_RTN to the SIGNAL_GND. The 28VDC_RTN is pre-EMI filter while the SIGNAL_GND is post-EMI filter.

ESI recommends communication via a CAN network. CAN is ideal for real-time embedded networking. It is proven to be robust as well as flexible. The supported CAN protocol can be downloaded from the ESI web site. ESI plans to support CANOpen in a future software update.

RS-422 is a good alternate to CAN. It is robust like CAN but not as flexible. The supported RS-422 protocol can be downloaded from the ESI web site.

USB is not supported. Do not connect the USB to a computer while the **Beetle** is enabled as the USB is highly susceptible to noise and has been known to damage USB ports on the computer.

A separate isolated CAN interface is provided with the following signals:

- ISO_CAN+
- ISO_CAN-
- ISO_GND

The isolated CAN allows communication on system without a common ground.

While ESI recommends a digital system interface such as CAN or RS-422, analog inputs and outputs are provided for legacy systems where digital communication is not possible.

Digital and Analog IO signals can be configured by ESI Motion's "HiDS" motor controller software tool for use in the end application.

Digital Inputs can be configured for various functions such as drive enable. Analog inputs can be configured as inputs to the system as well. For example, the analog inputs can be used to give the **Beetle** servo drive a torque or velocity command. They can also be

used to inject a test signal for use with a Dynamic Signal Analyzer or other test equipment.

Analog outputs can be setup in HiDS to represent an analog value for any variable in software in real-time. The unit provides two analog outputs. The user must account for the output impedance of the analog output when using these signals.

This analog input is provided to support legacy analog systems. ESI recommends the use of a digital interface (CAN or RS-422) when possible.

Two 24V brake drivers are provided. The brake drives normally power brakes in application to prevent Z-axis movement while the motor is disabled. The brakes are electrically asserted when the motor is enabled.

Motor Power

The Motor Power wires provide three-phase power to the motor.

ESI Motion's HiDS Application

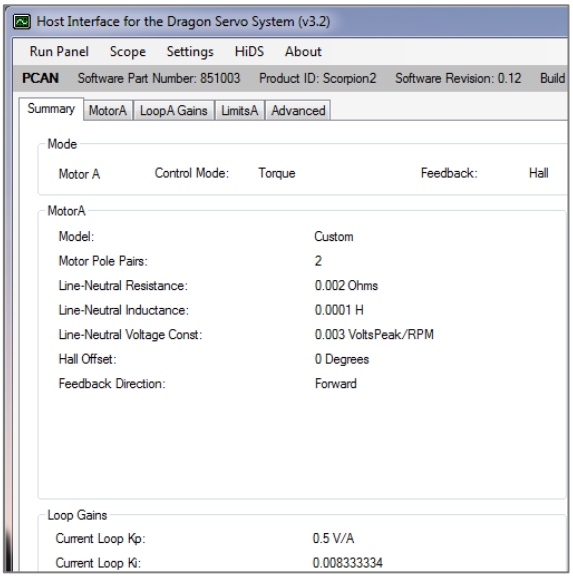
The Host Interface for Drive/Servo Controller (HiDS) is ESI Motion's servo motor controller software tool.

This innovative application allows users to configure a servo motor control system quickly, and with a great deal of flexibility. It's based upon a configurable, user-friendly GUI, with an integrated oscilloscope feature. Extensive data collection and control allows system tuning and troubleshooting.

On **Beetle**, the HiDS functions can be accessed via CAN. HiDS and the Controller User's Manual can be downloaded from ESI Motion's website at: https://www.esimotion.com/support/downloads/

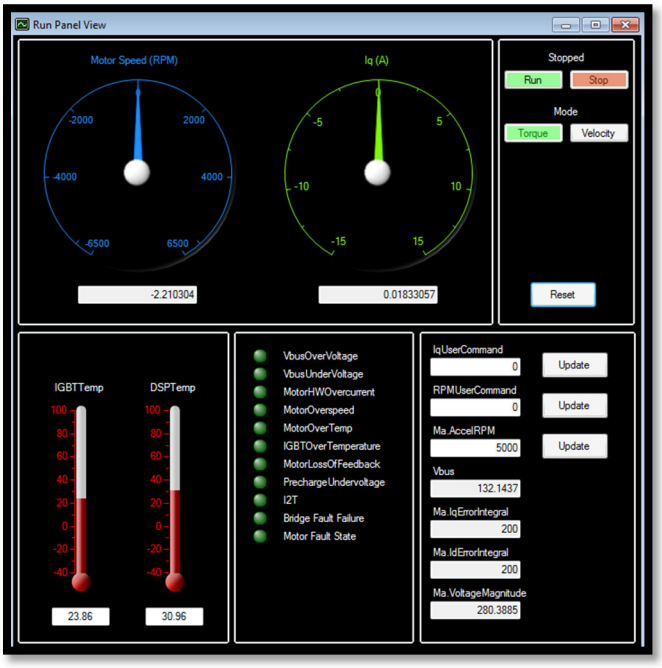
ESI's motion control products employ industry-standard current-loop, velocity-loop, and in some applications, a position-loop. Each of these control loops utilizes Proportional, Integral, and Derivative (PID) error correction to achieve the desired performance. The Controller User's Manual includes a procedure for tuning each control loop to match the intended application. After the tuning is completed, additional initial configuration using feedback is described in detail.

The Controller User's Manual walks you through the steps to set up limits, enter motor parameters, and tune the motor using the desired loop configuration. An excerpt from the summary tab shown below is an example view of key device configuration parameters:

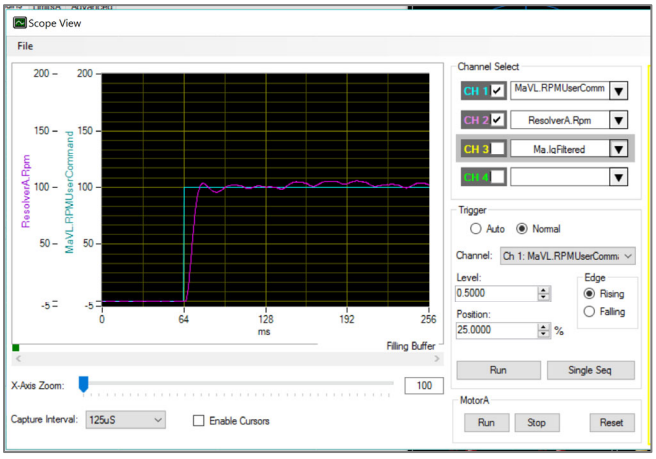


HiDS allows extreme flexibility via simply changing parameters, without the need to reload custom software.

The HiDS Run Panel facilitates control commands and monitoring of parameters such as motor speed and current:



A typical velocity-loop step response, displayed on the built-in oscilloscope function, is shown below:



The design of the ESI Motion **Beetle** servo controller and HiDS tool allow for tremendous flexibility and capabilities in motor control and monitoring, to ensure success of the most challenging motion control applications.

Connector Pinouts

Interfaces for each Beetle connectors are shown in this section. See each respective diagram for the pinout numbering.

J6 Pinout Assignments

J6 System Connector Pinout

J6 PIN	NAME	I/O	DESCRIPTION	TYPE
1	28VDC_IN		28VDC_IN	Logic Power
2	GND	--	Logic Voltage Return	Ground
3	28VDC_IN		28VDC_IN	Logic Power
4	GND	--	Logic Voltage Return	Ground
5	ANALOG_IN_7	IN	Single Ended Analog Input	Analog Input -5 to 8 volts
6	Reserved	---	Do not connect	
7	Reserved	---	Do not connect	
8	Reserved	---	Do not connect	
9	Reserved	---	Do not connect	
10	Reserved	---	Do not connect	
11	Reserved	---	Do not connect	
12	Reserved	---	Do not connect	
13	RS422_TX+	OUT	RS-422 Serial Bus Transmit (+)	RS-422
14	RS422_TX-	OUT	RS-422 Serial Bus Transmit (-)	RS-422
15	RS422_RX+	IN	RS-422 Serial Bus Receive (+)	RS-422
16	RS422_RX-	IN	RS-422 Serial Bus Receive (-)	RS-422
17	CAN+	I/O	CAN_A High	CAN
18	CAN-	I/O	CAN_A Low	CAN
19	USB_D+	I/O	USB Data Positive	USB 2.0
20	USB_D-	I/O	USB Data Negative	USB 2.0
21	GND	--	Logic Voltage Return	Ground
22	GND	--	Logic Voltage Return	Ground
23	ANALOG_IN_2+ (CMD+_MB)	IN	Analog In 2 (+), *can be used as* Command Positive Motor B	±10 Volt Analog Input
24	ANALOG_IN_1- (CMD-_MA)	IN	Analog In 1 (-), *can be used as* Command Negative Motor A	±10 Volt Analog Input
25	ANALOG_IN_1+ (CMD+_MA)	IN	Analog In 1 (+), *can be used as* Command Positive Motor B	±10 Volt Analog Input
26	ANALOG_IN_2- (CMD-_MB)	IN	Analog In 2 (-), *can be used as* Command Negative Motor B	±10 Volt Analog Input
27	BUF_ATP1(1)	OUT	Analog Test Point 1	Analog Output
28	BUF_ATP2(1)	OUT	Analog Test Point 2	Analog Output
29	Reserved	---	Do not connect	
30	Reserved	---	Do not connect	
31	Reserved	---	Do not connect	
32	Reserved	---	Do not connect	
33	5VDC_OUT	OUT	5 Volt Encoder/Hall/Aux Power	Logic Power
34	5VDC_OUT	OUT	5 Volt Encoder/Hall/Aux Power	Logic Power
35	Reserved	---	Do not connect	

36	Reserved	---	Do not connect	
37	GND	--	Logic Voltage Return	Ground
38	BOOT_CAN	I/O	Boot CAN High/Low	CAN
39	Reserved	---	Do not connect	
40	Reserved	---	Do not connect	
41	BRAKE+MA		Motor A Brake	Brake
42	GND	--	Logic Voltage Return	Ground
43	BRAKE-MA		Motor A Brake Return	Brake
44	GND	--	Logic Voltage Return	Ground
45	DIGITAL_OUTPUT_1(2)	OUT	Digital Output	Digital Output
46	DIGITAL_OUTPUT_3(2)	OUT	Digital Output	Digital Output
47	DIGITAL_OUTPUT_4(2)	OUT	Digital Output	Digital Output
48	DIGITAL_OUTPUT_2(2)	OUT	Digital Output	Digital Output
49	BRAKE+MB	---	Motor B Brake	Brake
50	BRAKE-MB	---	Motor B Brake Return	Brake

Notes:

1. Referred to as ATPObject.CH1 and ATPObject.CH2 in HiDS.
2. Can be configured to output any HiDS variable.

J5 Pinout Assignments

J5 Feedback Connector Pinout

J5 PIN	NAME	I/O	DESCRIPTION	TYPE
1	EXE+MA	OUT	Resolver Excitation Output Positive Motor A	Resolver Output
2	EXE-MA	OUT	Resolver Excitation Output Negative Motor A	Resolver Output
3	SIN+MA (ANALOG_IN_3+)	IN	Resolver SIN Positive Motor A, *can be used as* ANALOG_IN_3+	Resolver Input ±5 Volt Analog Input
4	SIN-MA (ANALOG_IN_3-)	IN	Resolver SIN Negative Motor A, *can be used as* ANALOG_IN_3-	Resolver Input ±5 Volt Analog Input
5	COS+MA (ANALOG_IN_4+)	IN	Resolver COS Positive Motor A, *can be used as* ANALOG_IN_4+	Resolver Input ±5 Volt Analog Input
6	COS-MA (ANALOG_IN_4-)	IN	Resolver COS Negative Motor A, *can be used as* ANALOG_IN_4-	Resolver Input ±5 Volt Analog Input
7	EXE+MB	OUT	Resolver Excitation Output Positive Motor B	Resolver Output
8	EXE-MB	OUT	Resolver Excitation Output Negative Motor B	Resolver Output
9	SIN+MB (ANALOG_IN_5+)	IN	Resolver SIN Positive Motor B, *can be used as* ANALOG_IN_5+	Resolver Input ±5 Volt Analog Input
10	SIN-MB (ANALOG_IN_5-)	IN	Resolver SIN Negative Motor B, *can be used as* ANALOG_IN_5-	Resolver Input ±5 Volt Analog Input
11	COS+MB (ANALOG_IN_6+)	IN	Resolver COS Positive Motor B, *can be used as* ANALOG_IN_6+	Resolver Input ±5 Volt Analog Input
12	COS-MB (ANALOG_IN_6-)	IN	Resolver COS Negative Motor B, *can be used as* ANALOG_IN_6-	Resolver Input ±5 Volt Analog Input
13	MOTOR_TEMP+MA	IN	Temperature Positive Motor A	Temperature Input
14	MOTOR_TEMP-MA	IN	Temperature Negative Motor A	Temperature Input
15	MOTOR_TEMP+MB	IN	Temperature Positive Motor B	Temperature Input
16	MOTOR_TEMP-MB	IN	Temperature Negative Motor B	Temperature Input
17	Reserved	---	Do not connect	
18	Reserved	---	Do not connect	
19	A+MA (DIGITAL_IN_1+)	IN	Quadrature Encoder A Positive Motor A, *can be used as* Digital Input 1	Differential Digital Input
20	A-MA (DIGITAL_IN_1-)	IN	Quadrature Encoder A Negative Motor A, *can be used as* Digital Input 1	Differential Digital Input
21	B+MA (DIGITAL_IN_2+)	IN	Quadrature Encoder B Positive Motor A, *can be used as* Digital Input 2	Differential Digital Input
22	B-MA (DIGITAL_IN_2-)	IN	Quadrature Encoder B Negative Motor A, *can be used as* Digital Input 2	Differential Digital Input
23	I+MA (DIGITAL_IN_3+)	IN	Quadrature Encoder I Positive Motor A, *can be used as* Digital Input 3	Differential Digital Input
24	I-MA (DIGITAL_IN_3-)	IN	Quadrature Encoder I Negative Motor A, *can be used as* Digital Input 4	Differential Digital Input
25	BISS_CLK+MA	OUT	BiSS-C Clock Positive Motor A	Differential Digital Output

26	BISS_CLK-MA	OUT	BiSS-C Clock Negative Motor A	Differential Digital Output
27	BISS_DATA_+MA	IN	BiSS-C Data Positive Motor A	Differential Digital Input
28	BISS_DATA-MA	IN	BiSS-C Data Negative Motor A	Differential Digital Input
29	GND	--	Logic Voltage Return	Ground
30	GND	--	Logic Voltage Return	Ground
31	A+MB (DIGITAL_IN_4+)	IN	Quadrature Encoder A Positive Motor B, *can be used as* Digital Input 4	Differential Digital Input
32	A-MB (DIGITAL_IN_4-)	IN	Quadrature Encoder A Negative Motor B, *can be used as* Digital Input 4	Differential Digital Input
33	B+MB	IN	Quadrature Encoder B Positive Motor B	Differential Digital Input
34	B-MB	IN	Quadrature Encoder B Negative Motor B	Differential Digital Input
35	I+MB	IN	Quadrature Encoder I Positive Motor B	Differential Digital Input
36	I-MB	IN	Quadrature Encoder I Negative Motor B	Differential Digital Input
37	BISS_CLK+MB	OUT	BiSS-C Clock Positive Motor B	Differential Digital Output
38	BISS_CLK-MB	OUT	BiSS-C Clock Negative Motor B	Differential Digital Output
39	BISS_DATA+MB	IN	BiSS-C Data Positive Motor B	Differential Digital Input
40	BISS_DATA-MB	IN	BiSS-C Data Negative Motor B	Differential Digital Input
41	HALL_A_MA	IN	Hall A Motor A	Open Collector Input
42	HALL_A_MB	IN	Hall A Motor B	Open Collector Input
43	HALL_B_MA	IN	Hall B Motor A	Open Collector Input
44	HALL_B_MB	IN	Hall B Motor B	Open Collector Input
45	HALL_C_MA	IN	Hall C Motor A	Open Collector Input
46	HALL_C_MB	IN	Hall C Motor B	Open Collector Input
47	5VDC_OUT	OUT	5 Volt Encoder/Hall/Aux Power	Logic Power
48	5VDC_OUT	OUT	5 Volt Encoder/Hall/Aux Power	Logic Power
49	Reserved	---	Do not connect	
50	Reserved	---	Do not connect	

Wire Pinout Assignments

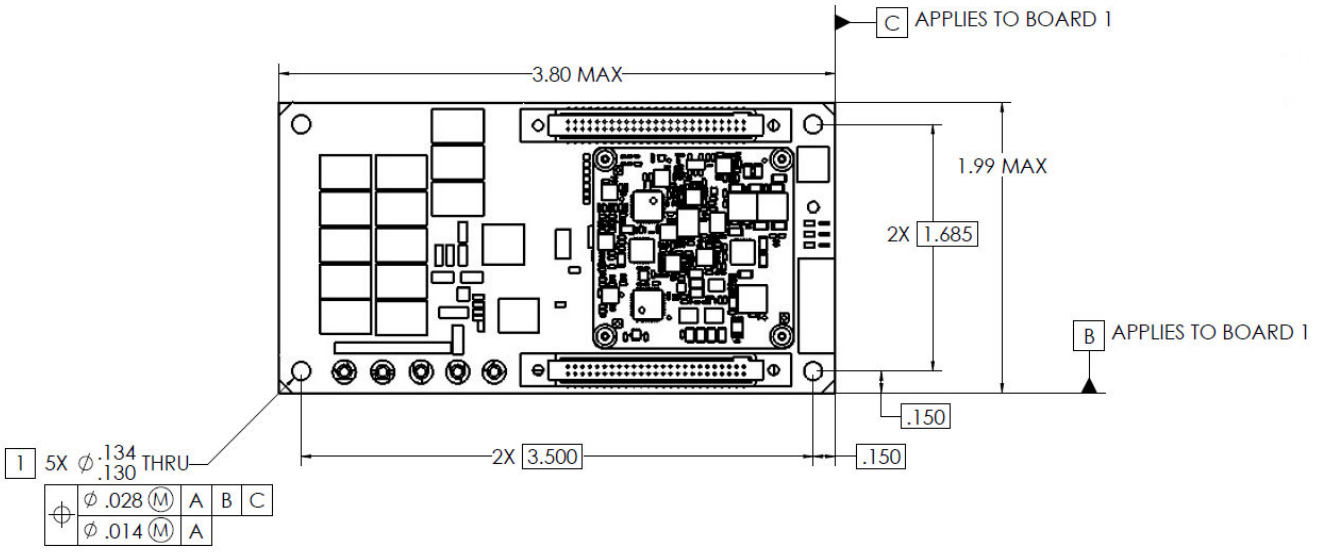
Interface Pinout/Functions

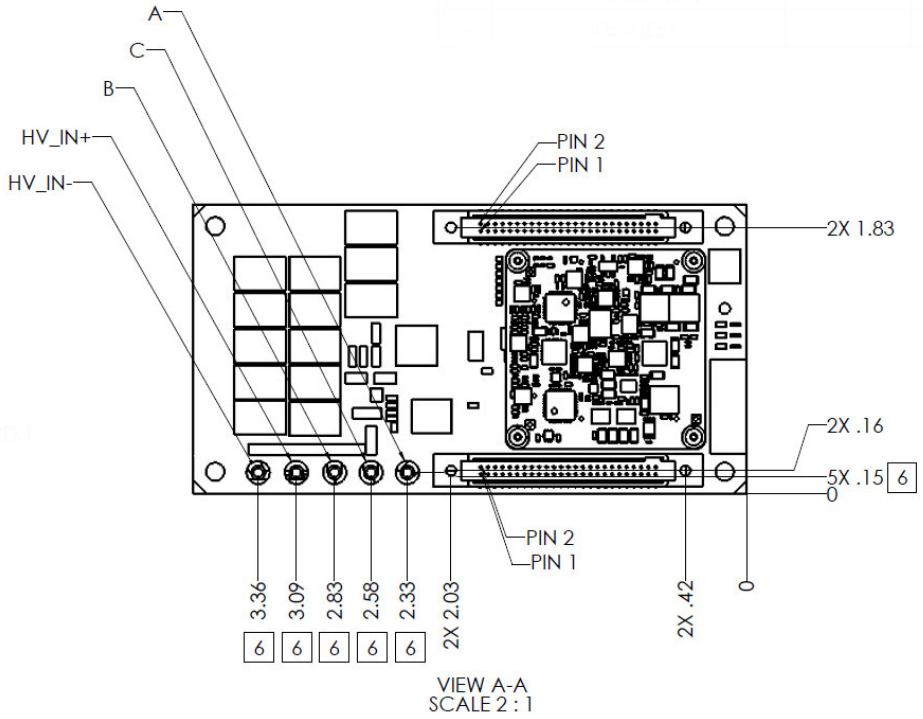
WIRE NAME	I/O	DESCRIPTION	TYPE
A	OUT	Motor A Phase A	Motor Power
C	OUT	Motor A Phase C	Motor Power
B	OUT	Motor A Phase B	Motor Power
V_BUS (HV_IN+)	IN	Motor Power	DC Bus
V_BUS_RTN (HV_IN-)	IN	Motor Power Return	DC Bus

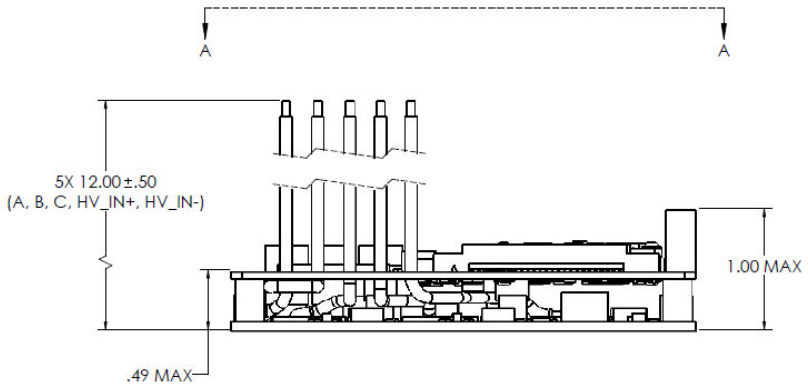
Envelope and Dimensions

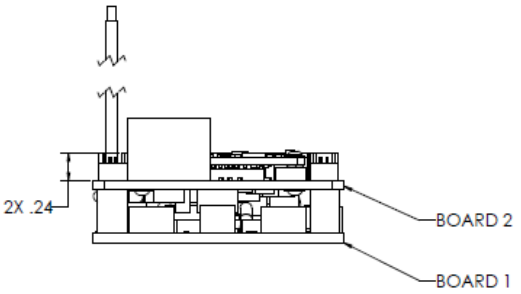
Mechanical Dimensions

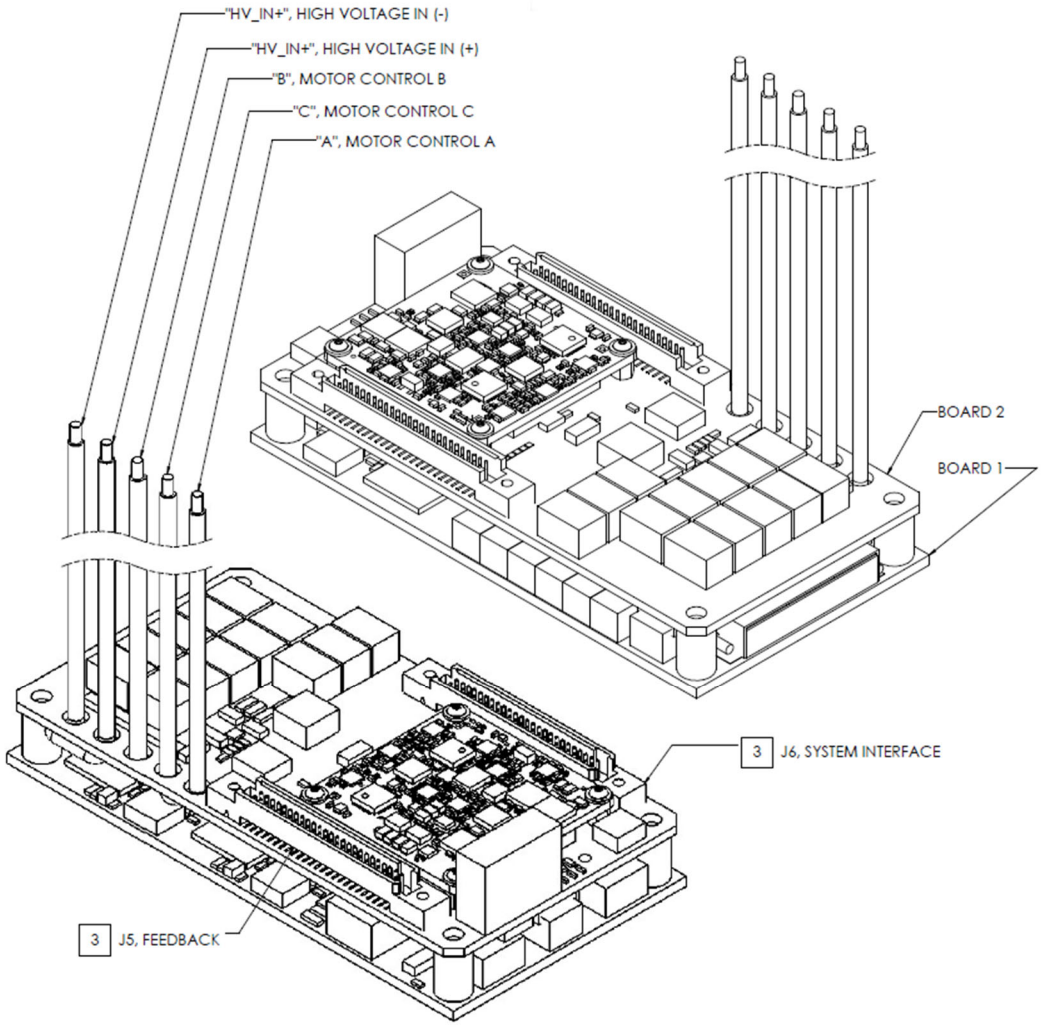
All Dimensions labeled in **INCHES.**



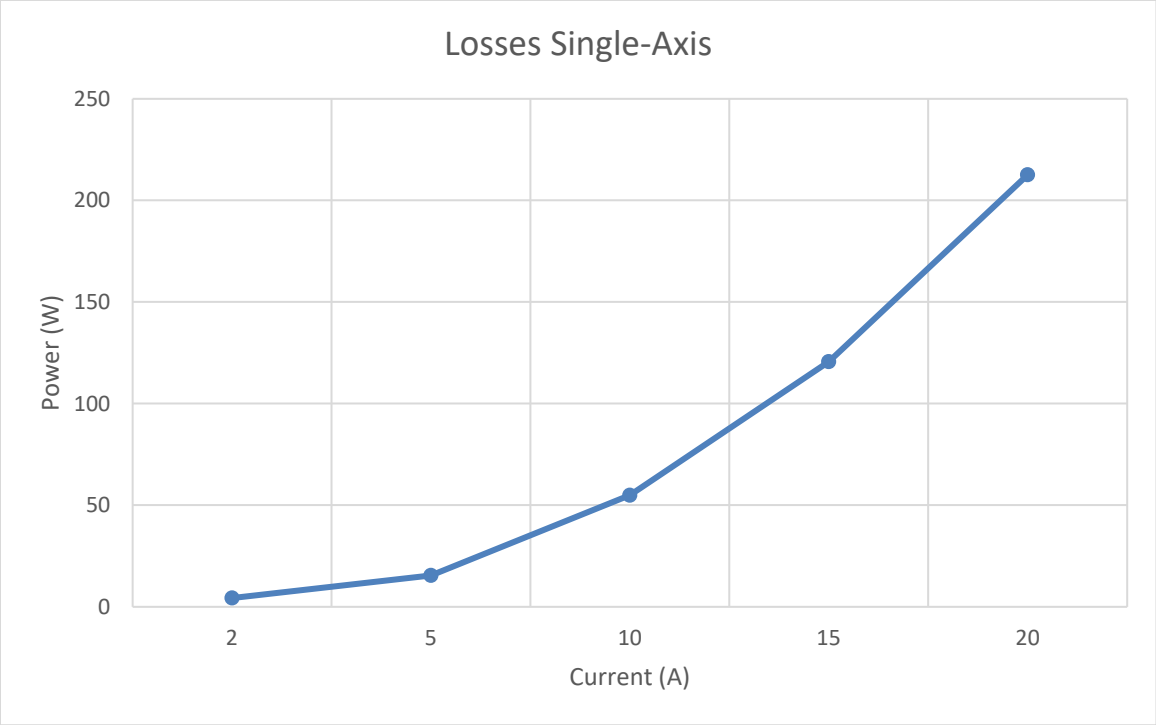








Power Loss Curve



Ordering Information

Beetle Servo Drive Module Configuration Option

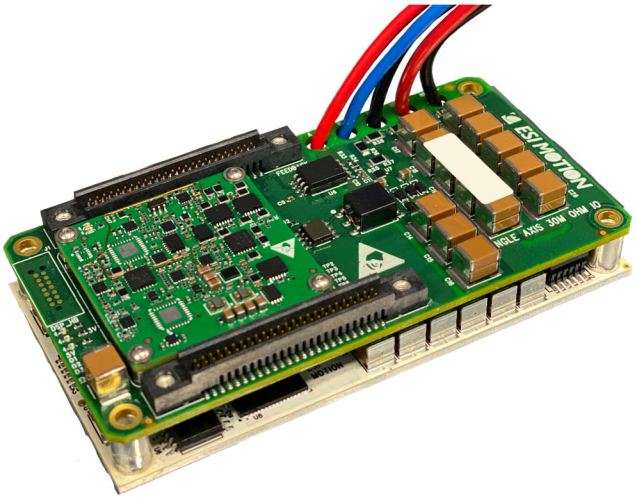
B 20A XXXV S

Servo Drive	Continuous Current[1]	Voltage[2]	Axis
B = Beetle	20 = 20A 10 = 10A 05 = 5A	300 = 300V	S = Single

Notes:
1. Peak Sine Wave, per axis. Consult factory for higher current options.
2. 600V and 900V Options Available. Please contact ESI for more information.

Example

Part Number:	B20A300VS
Servo Drive:	Beetle
Continuous Current:	20 Amp Total
Max Bus Voltage:	300 VDC
Motor Axis:	Single-Axis



Model Availability List

The following table lists available models:

Single-Axis:	
A/V	**300V**
20A	**B20A300VS**
10A	**B10A300VS**
05A	**B05A300VS**

Notes:
1. 600V and 900V Options Available. Please Contact ESI for more Information.
2. Please contact ESI for Customization, other feedback options or motor types.