

NOVA SERVO DRIVE SYSTEM



The Nova servo drive is developed specifically for Low Earth Orbit (LEO) motion control applications.

This extremely lightweight controller is available in a dual-axis configuration and is one of the smallest servo drives for space applications on the market today.

The Nova incorporates wide bandgap semiconductors, and a DO-178 compliant controller. It is equipped with inrush protection and a brake driver and is packaged in a rugged case which does not require additional cooling.

This versatile servo drive is ideal for high performance space applications operating in a vacuum and in a high vibration environment, where efficiency and weight are critical.



Features:

- Radiation tolerance
- Light-weight
- Dual-axis configuration
- Sealed, shock and vibration tolerant construction
- Torque, velocity or position control
- Configurable, user friendly GUI with integrated oscilloscope feature
- Motor types: DC Brushless
- Feedback: Resolver

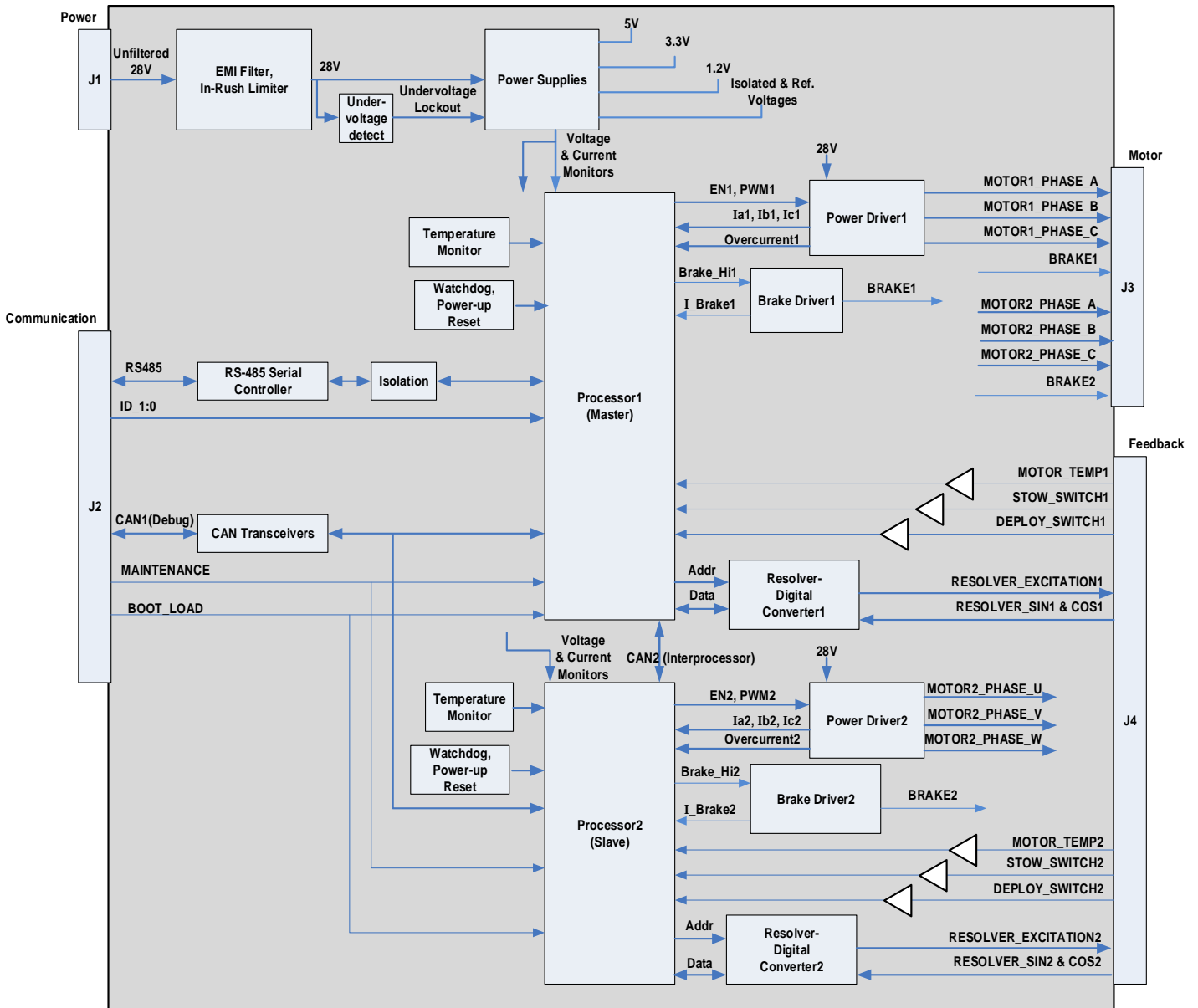
Specifications:

- Bus Voltage (DC) 28V
- Peak Current up to 6A (per axis)
- Output Power 100W (per axis)
- Efficiency >95% (full load)
- Operating Temperature - 40°C to 71°C
- Maximum Electrical Speed 75,000 RPM
- Weight 2 lbs.
- Size 4.0" W x 3.5" L x 1.9" H

Compliance:

- Electromagnetic Interference MIL-STD-461
- Environmental Considerations MIL-STD-810
- Electrical Power Characteristics MIL-STD-704
- Software Design Assurance DO-178
- NASA Compliant

Nova (Dual Axis) System Diagram



Electrical Interfaces – J1

Power, J1			
PIN	NAME	DESCRIPTION	TYPE
1	28VDC_PWR	28VDC In	Power Input
2	28VDC_PWR_GND	28VDC Return	Power Return

Electrical Interfaces – J2

Communication, J2			
PIN	NAME	DESCRIPTION	TYPE
1	RS485+	RS485 Positive	Digital In/Out
2	RS485-	RS485 Negative	Digital In/Out
3	RS485_GND	RS485 Ground	Ground
4	BOOTLOAD_GND	Bootloader Ground	Ground
5	MAINT_GND	Maintenance Ground	Ground
6	CANH	CAN High	Digital In/Out
7	CANL	CAN Low	Digital In/Out
8	MAINT_EN	Maintenance Enable	Digital Input
9	BOOTLOAD_EN	Bootloader Enable	Digital Input
10	ID_0	Identifier Bit 0	Digital Input
11	ID_1	Identifier Bit 1	Digital Input
12	ID_1_GND	Identifier Bit 1 Ground	Ground
13	ID_0_GND	Identifier Bit 0 Ground	Ground

Electrical Interfaces – J3

Motor, J3			
PIN	NAME	DESCRIPTION	TYPE
1	MA_PHASE_A	Motor A Phase A	Power Output
2	MA_PHASE_B	Motor A Phase B	Power Output
3	MA_PHASE_C	Motor A Phase C	Power Output
4	BRAKE+_MA	Brake Positive Motor A	Power Output
5	BRAKE-_MA	Brake Negative Motor A	Power Output
6	SPARE (NC)	Spare (No Connect)	N/A
7	SPARE (NC)	Spare (No Connect)	N/A
8	MB_PHASE_A	Motor B Phase A	Power Output
9	MB_PHASE_B	Motor B Phase B	Power Output
10	MB_PHASE_C	Motor B Phase C	Power Output
11	BRAKE+_MB	Brake Positive Motor B	Power Output
12	BRAKE-_MB	Brake Negative Motor B	Power Output
13	SPARE (NC)	Spare (No Connect)	N/A

Electrical Interfaces – J4

Feedback, J4			
PIN	NAME	DESCRIPTION	TYPE
1	EXE+_MA	Resolver Excitation Positive Motor A	Analog Output
2	EXE-_MA	Resolver Excitation Negative Motor A	Analog Output
3	SIN+_MA	Resolver Sin Positive Motor A	Analog Input
4	SIN-_MA	Resolver Sin Negative Motor A	Analog Input
5	COS+_MA	Resolver Cos Positive Motor A	Analog Input
6	COS-_MA	Resolver Cos Negative Motor A	Analog Input
7	DIN1+_MA	Digital Input 1 Positive Motor A	Digital Input
8	DIN1-_MA	Digital Input 1 Negative Motor A	Digital Input
9	DIN2+_MA	Digital Input 2 Positive Motor A	Digital Input
10	DIN2-_MA	Digital Input 2 Negative Motor A	Digital Input
11	GND	Ground	Ground
12	MTR_TEMP+_MA	Temperature Positive Motor A	Analog Input
13	MTR_TEMP-_MA	Temperature Negative Motor A	Analog Input
14	EXE+_MB	Resolver Excitation Positive Motor B	Analog Output
15	EXE-_MB	Resolver Excitation Negative Motor B	Analog Output
16	SIN+_MB	Resolver Sin Positive Motor B	Analog Input
17	SIN-_MB	Resolver Sin Negative Motor B	Analog Input
18	COS+_MB	Resolver Cos Positive Motor B	Analog Input
19	COS-_MB	Resolver Cos Negative Motor B	Analog Input
20	DIN1+_MB	Digital Input 1 Positive Motor B	Digital Input
21	DIN1-_MB	Digital Input 1 Negative Motor B	Digital Input
22	DIN2+_MB	Digital Input 2 Positive Motor B	Digital Input
23	DIN2-_MB	Digital Input 2 Negative Motor B	Digital Input
24	GND	Ground	Ground
25	MTR_TEMP+_MB	Temperature Positive Motor B	Analog Input
26	MTR_TEMP-_MB	Temperature Negative Motor	Analog Input

Nova Servo Drive

Overview

The following describes both the electrical and physical interfaces for the Nova Servo Drive Series. Included in this document is information necessary to integrate the dual-axis Nova Servo Drive with other system components.

Nova Servo Drive can be connected to two types of communication networks:

- RS-485
- Controller Area Network (CAN)

Both networks are ideal for real-time embedded networking. They have been proven to be stable and robust as well as flexible. The Nova Servo Drive can be easily modified through software to accept commands and report feedback without hardware modification.

This document discusses the system interconnect by functional group. The four groups are as follows:

- Power
- Motor
- Communication
- Feedback

All connectors are 805 series, which feature low profile shells with minimum protrusion inside enclosures, optimizing weight and volume.

Power

The power input connector is the main power input. The power signals are decoupled from the control circuitry.

The power connector is an insert arrangement 10-2, part number 805-005-02MT10-2P. The box connections are pins and they mate with a socket-type connector.

Feedback

The Nova Servo Drive contains dual motor resolvers feedback interfaces. The feedback interfaces are on a single 26-pin connector. The connector is an insert arrangement 12-26. The connector part number is 805-005-02MT12-26S. The box connections are sockets and mate with a pin-type connector.

Communication

The communication connector contains the following signals: RS485, CAN, Maintenance, Bootloader and Identifiers.

The communication connector is an insert arrangement 10-13. The connector part number is 805-005-02MT10-13P. The box connections are pins and mate with a socket-type connector.

The communication signals are the main interface used in an end application. This interface also includes service inputs that can be used for the following update functions: Connect using the Host Interface for the Nova Servo (HiDS), Reprogramming.

Motor

The motor connector contains the following signals for both motors: Phase A, Phase B, Phase C, Brake.

The motor connector is an insert arrangement 10-13. The connector part number is 805-005-02MT10-13S. The box connections are sockets and they mate with a pin-type connector.

The Nova Servo Drive provides two 28 V brake drivers. The brake current is nominally 2 amps and is current limited to 12.5 A +/- 10%.



Mechanical

