

Galil Optical Screw Terminal (GOST) Overview and Installation Manual

Overview

The GOST board is a daughter card made to plug directly on top of the DMC-21X3 (1 through 4 axis) controller to simplify interconnect wiring to servo/stepper amplifiers and machine related I/O. The board breaks out and provides convenient screw terminal terminations for all of the signals on the DMC-21X3 96 pin DIN header. Two versions of the GOST board are available:

- **GOST-DMC2113** - for single axis applications.
- **GOST-DMC2143** - for 2 to 4 axis applications.

In addition to the screw terminals, the GOST board provides optical isolation for all of the inputs and outputs as follows:

- Optical isolation for the general-purpose inputs (Sink/Source selectable; 4 inputs at 24VDC; 4 inputs independently selectable at 5 - 24 VDC).
- Optical isolation for the general-purpose outputs (Sink/Source selectable, 8 outputs at 5 - 48 VDC, 350mA source per point).
- Optical isolation for the overtravel and home limit inputs (Sink/Source selectable, 24 VDC).
- Optical isolation for the amplifier enable outputs (X, Y, Z, and W independently selectable Sink/Source, 5 – 48 VDC).
- Internal suppressors on general-purpose outputs for inductive loads.
- Field replaceable solid-state relay output IC's.
- Isolation of GOST board logic power and Galil DMC-21X3 power.
- Direct routing from Galil DMC-21X3 to screw terminals for the motor command (analog), encoder, and PWM/direction, and 24 VDC power signals.

To properly mount the GOST board to the DMC-21X3 make sure to order the options listed below:

- -V Vertical Ethernet and RS232 connectors (up)
- -DCXX DC-to-DC Converter (XX = 24 or 48)
- -UP 96 pin DIN pointing up (vertical)
- -VP 4 pin Molex power connector vertical

Example DMC-21X3 part number:

- DMC-2143-V-DC24-DIN-UP-VP

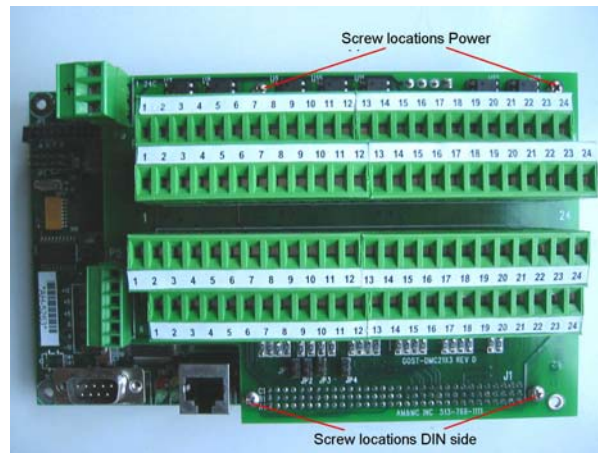
Installation

Before installing the GOST board, be sure to install any jumpers on the Galil board that may be covered by the GOST board (stepper motor jumper, etc.) Consult the Galil hardware manual for jumper locations and installation instructions.

Remove GOST board from packaging, be sure to observe anti-static practices. If the DMC-21X3 has a DIN rail adapter you will need to remove one end of the DIN adapter (2 screws) and slide the DMC-21X3 out. The GOST installation kit includes two standoffs, 4 short screws, 2 long screws, 2 plastic nuts, and 4 jumpers (Figure 1). Using the shorter screws mount the standoffs on the two holes on the bottom of the GOST board on the power connector side.

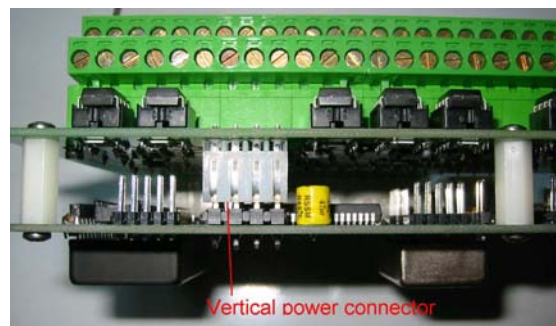


GOST installation kit



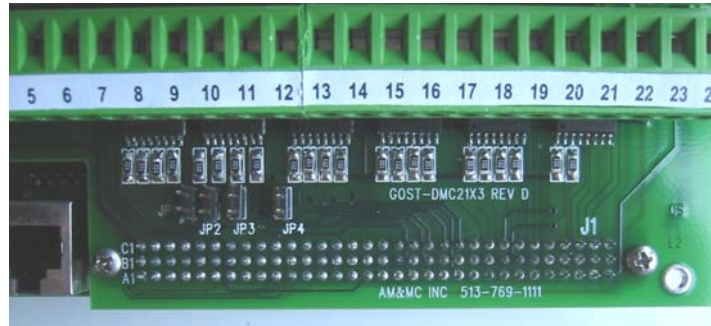
Screw locations

Orient the female 96 pin DIN on the GOST board with the male 96 pin DIN on the DMC-21X3 and the female 4 pin Molex connector on the GOST board with the male 4 pin Molex power connector on the DMC-21X3 and gently connect the boards together until the standoff's on the GOST board are touching the DMC-21X3 board. Install the 2 remaining short screws into the standoffs.



Standoffs on power connector side

The longer screws are used to secure GOST to the DMC-21X3 in the holes immediately adjacent to the 96 pin DIN, start the screws through the top of the GOST board first and then run through the DMC-21X3. Use the plastic nuts on these screws under the DMC-21x3.

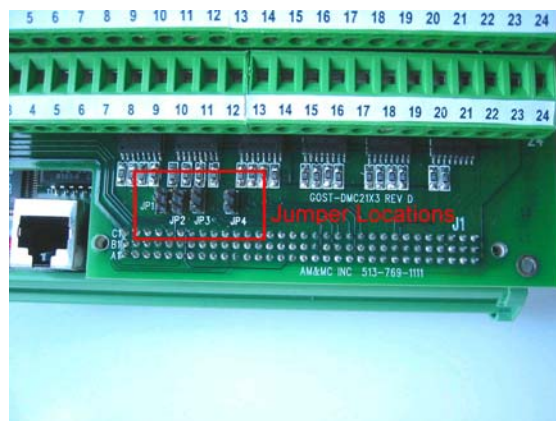


Long screw location on DIN side



Bottom of Galil board showing plastic nuts

Slide the DMC-21X3 back into the DIN rail adapter and install end cap. Note the jumper locations below; the jumpers are used ONLY when 5 VDC inputs are desired for general-purpose inputs 5 – 8. See section on general-purpose inputs 5 – 8 to determine if they should be installed for your application.



Power

The P6 screw terminal connector routes incoming DC power directly to the power connector on the Galil card only, it is not used anywhere else on the GOST board. Note that the DMC-2143 controller with the –DC24 option (24 VDC DC-to-DC converter) requires roughly 800 mA of current at 24 VDC.

P6 Terminal

Terminal #	Connection (Description)
1	Supply Common In
2	Supply + VDC In (+ VDC Depends on the Galil controller's DC-to-DC converter option used in this application)
3	Earth Ground

Power Supply Calculations

Power supply requirements are based on the current that the outputs are required to drive. Each output is capable of sourcing up to 350 mA at 24 VDC.

Output	Output Current Requirement (amps)	Max Output Current (amps)
General Purpose Output 1		.35
General Purpose Output 2		.35
General Purpose Output 3		.35
General Purpose Output 4		.35
General Purpose Output 5		.35
General Purpose Output 6		.35
General Purpose Output 7		.35
General Purpose Output 8		.35
Amp Enable Output X		.35
Amp Enable Output Y		.35
Amp Enable Output Z		.35
Amp Enable Output W		.35
Error Output		.35
Total	amps	4.2 amps

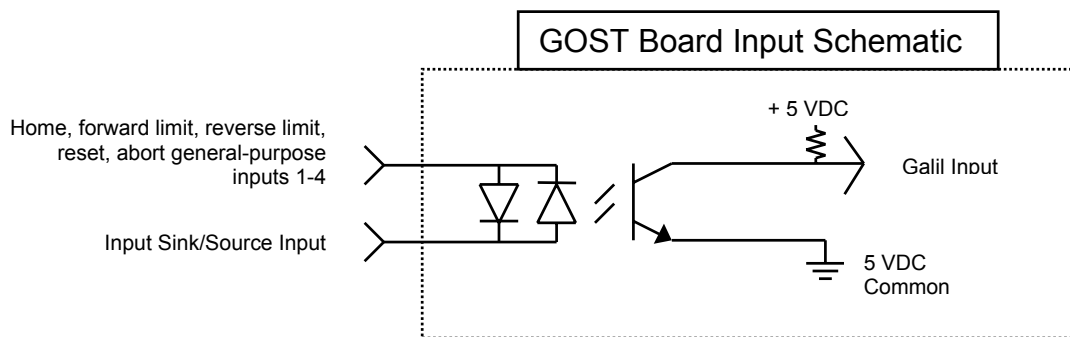
** **Note:** Combine DMC-21X3 power requirements above with the I/O power requirements if they share the same power supply.

Inputs

Home, forward limit, reverse limit, reset, abort, and general-purpose inputs 1 – 4 are optically isolated single wire inputs that can be configured sinking or sourcing (active high or low). The inputs use internally a bi-directional LED that has one side of the LED's connected to the "Input Sink/Source" input. The voltage that is connected to the "Input Sink/Source" then determines whether the input is sinking or sourcing (active high or low).

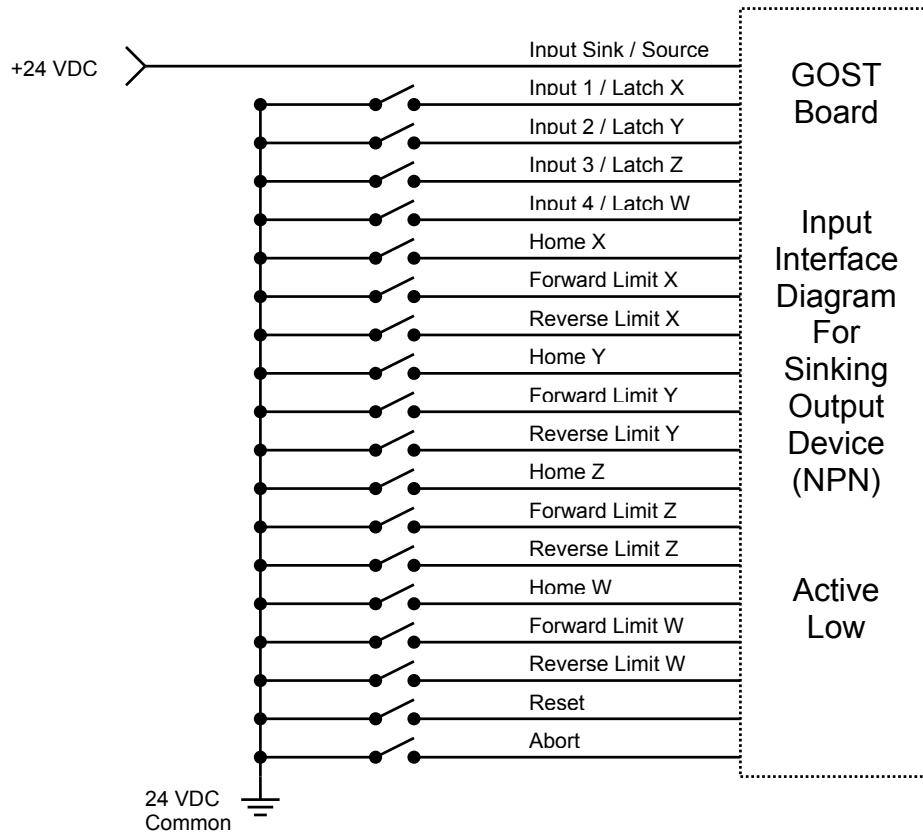
**** Note** – At 24 VDC an input will draw roughly 15 mA.

Input Schematic

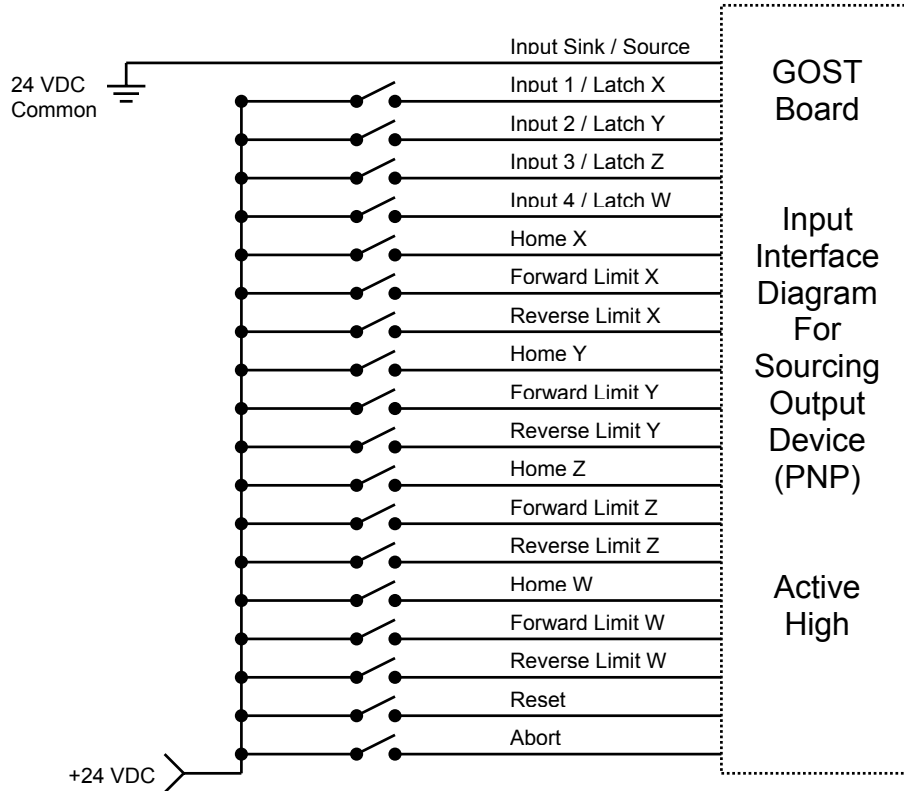


Determine whether the inputs are to be sinking or sourcing (active high or low) and follow the appropriate diagram.

Input Interface Diagram for Connection to Sinking Output Devices (NPN)



Input Interface Diagram for Connection to Sourcing Output Devices (PNP)



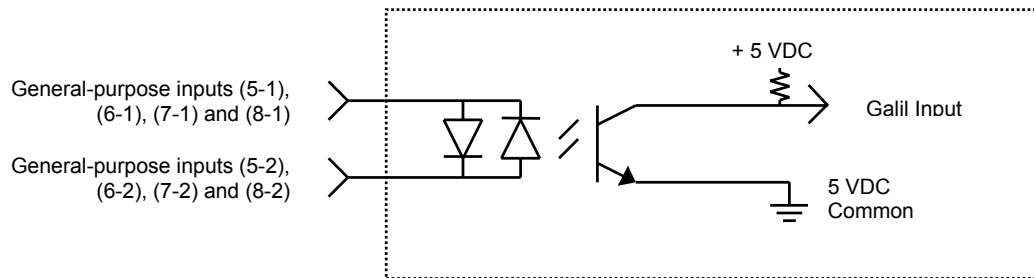
General-Purpose Inputs 5 – 8

General purpose inputs 5 – 8 are 2 wire inputs. They use the same input style as the other inputs with two distinct differences:

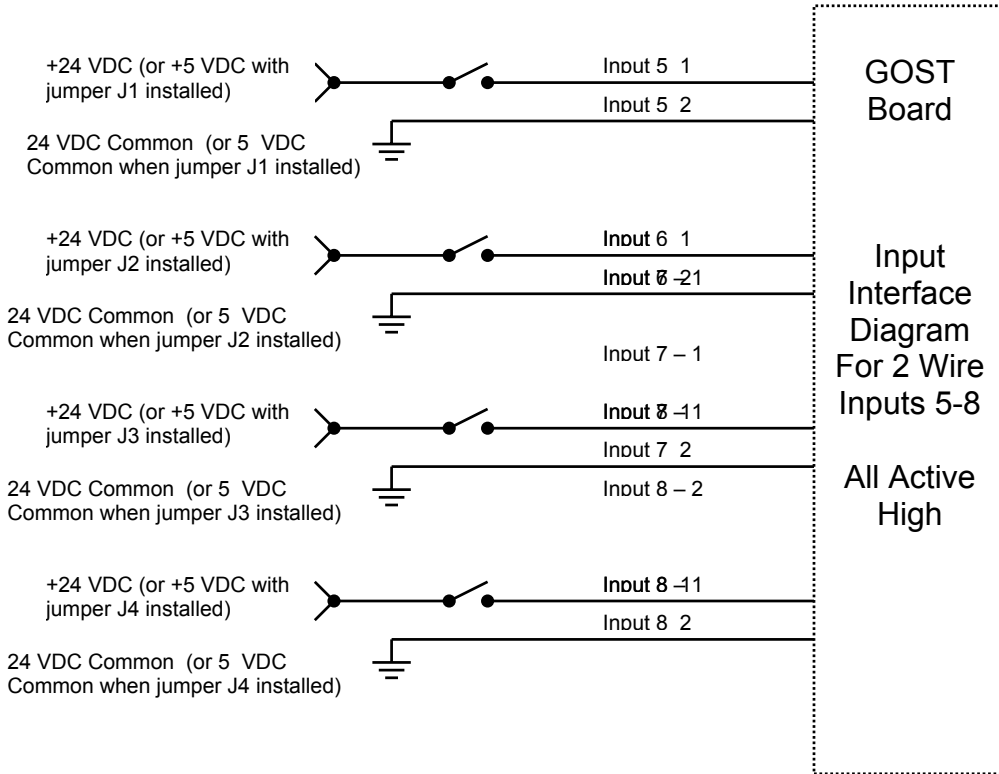
- (1) The inputs are independently jumper selectable for 5 VDC input. Install the jumper to use 5 VDC for the selected input. The table below identifies the jumper with the corresponding input.

Jumper	General-Purpose Input
JP1	5
JP2	6
JP3	7
JP4	8

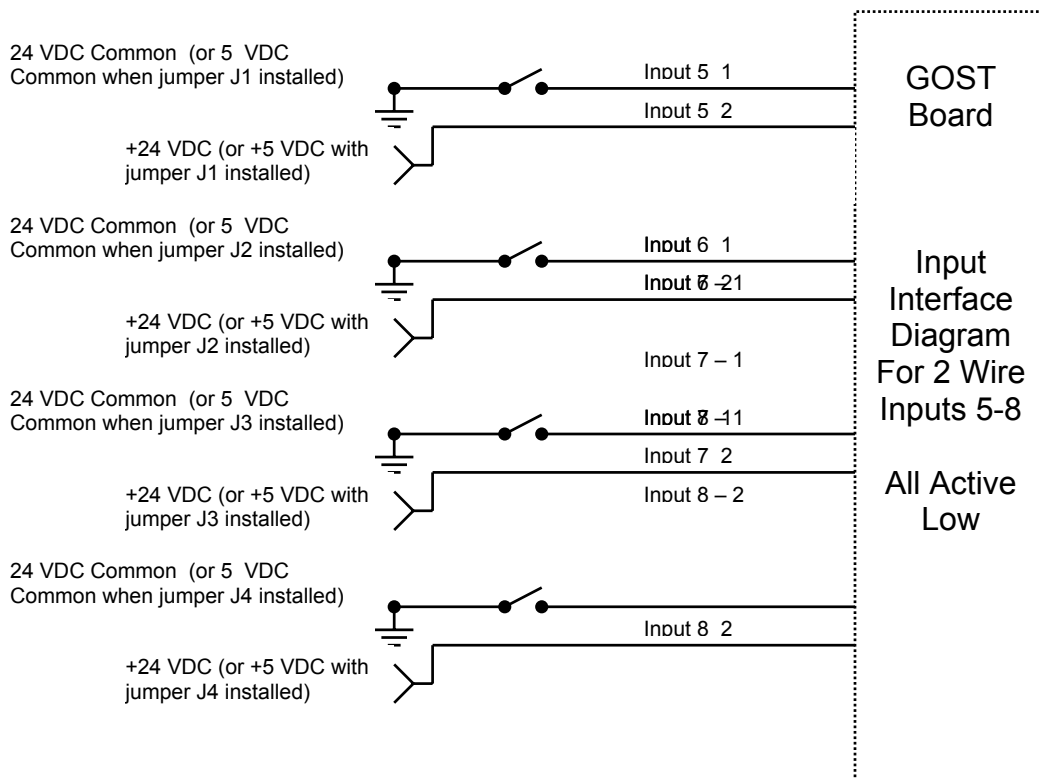
- (2) Unlike the home, forward limit, reverse limit, and general-purpose inputs 1-4 where one side is tied to either +24 VDC or 24 VDC common through the “Input Sink/Source” input (see section above), you must terminate both sides of these inputs.



Input Interface Diagram for Active High Inputs



Input Interface Diagram for Active Low Inputs

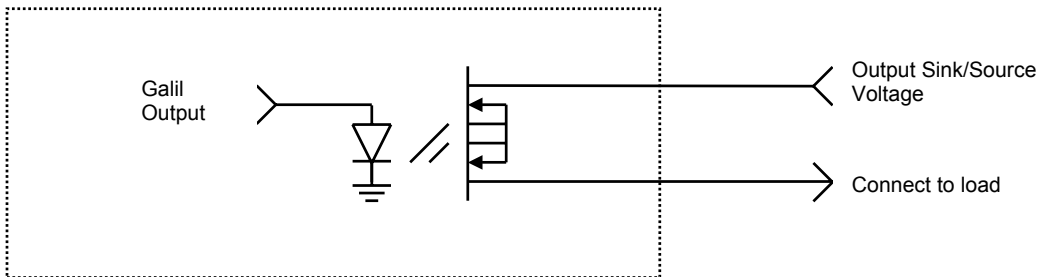


Outputs

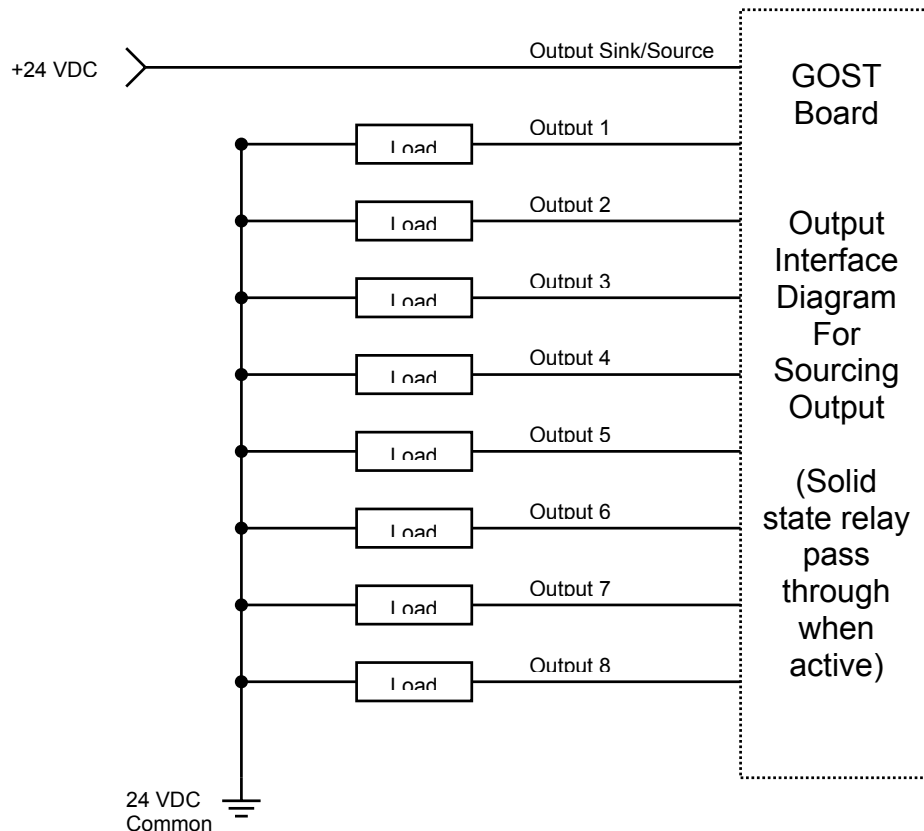
General Purpose Outputs

The general purpose outputs use a solid state relay as the output device. The solid state relay passes the voltage connected to the “Output Sink/Source” input when the output is activated.

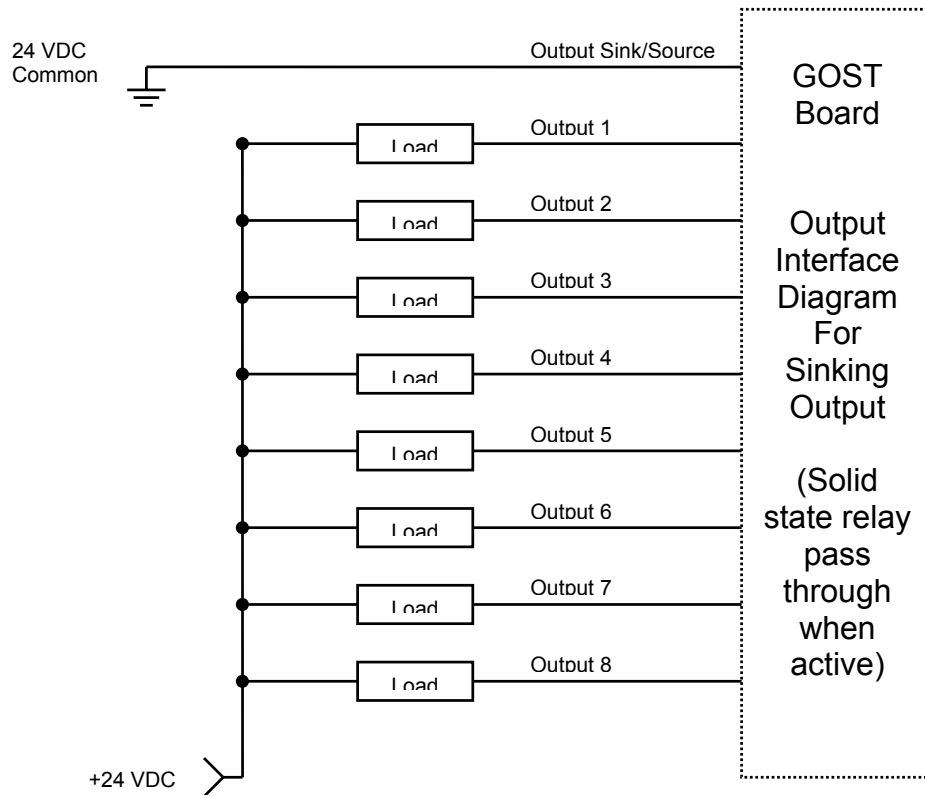
Output Schematic



Output Interface Diagram for Active High (Sourcing) Outputs



Output Interface Diagram for Active Low (Sinking) Outputs



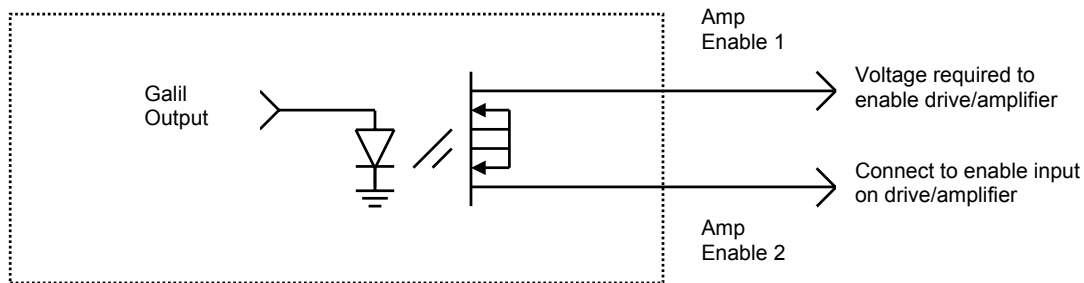
Output Solid State Relay Replacement Information

The outputs use a solid state relay that is socketed. In the unlikely event that an output fails, the chip can be replaced in the field. The solid state relay used is manufactured by NEC, part number PS7113-2A.

Amp Enable Outputs

The amplifier enable outputs are the same as the general purpose outputs in that they use a solid state relay as the output device. The primary difference for the amplifier enable outputs is that both sides of the relay are left open, it is up to the user to connect the voltage required to enable the drive/amplifier to one of the terminals and the other side directly to the enable input on the drive/amplifier. By having both sides of the relay available (Amp Enable 1 and Amp Enable 2) allows the

Amp Enable Output Schematic



Drive/Amplifier Enable Connection Table

Use the table below as a guide to configure the Amp Enable 1 and Amp Enable 2 connections. Note that this table is the same for each axis Amp Enable 1 and Amp Enable 2 (X, Y, Z, X).

Drive/Amplifier Enable Input Voltage Requirement	Amp Enable 1 (X,Y,Z,W)	Amp Enable 2 (X,Y,Z,W)
+24 VDC	Connect to +24 VDC	Connect to Drive/Amplifier Enable Input
24 VDC Common	Connect to 24 VDC Common	Connect to Drive/Amplifier Enable Input
+5 VDC	Connect to +5 VDC	Connect to Drive/Amplifier Enable Input
5 VDC Common	Connect to 5 VDC Common	Connect to Drive/Amplifier Enable Input

Other Connections

All of the remaining connections listed below are passed directly through the GOST board to the Galil DMC controller and are not isolated or buffered. Please consult the Galil hardware manual for proper connection and configuration. Note that when using the stepper outputs (PWM/Step and Sign/Dir) a jumper must be installed on the Galil board (consult Galil hardware manual) and the Galil motor type command (MT) must be issued with the proper motor type.

- Encoder Inputs
- Motor Command Outputs
- 24 VDC Connections on P6

