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POWER SUPPLIES

5VOB output current is limited to about 500mA with a 10V input. As input voltage increases the current limit increases slightly to about 550mA at 24V.

5V for Off-Board Items

Make this loop as small as possible

5V set-point for both converters is 5.0V ±3%.

Primary 5V

Make this loop as small as possible

This is set to trip at about 36.2V and will reset with a hysteresis of 0.4V. "OverV_DISABLEn" only disables the motor driver IC, and isn't read by the MCU. However, the MCU can also disable the motor driver IC by briefly setting "Vsupply-MON_{IO_4and5_RST}" as an output and pulling it high.

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For step/direction modes, the MtrX_B signals mask the Mtr_B_CLK signals. If MtrX_B is 1, the CLK signal is blocked and the output is held low (off). If MtrX_B is 0, the CLK signal is passed through inverted.

For other modes, setting the CLK signal to 0 will allow the MtrX_B signal to pass through inverted.

This diode protects the 5V OB supply in case 24V is accidentally connected to the 5V pins on the CPM connectors.
ClearPath / Motor-Expansion Ports

CPM / Motor / Speaker port 2
Molex Minifit-8
P2 46999-0567

CPM / Motor / Speaker port 3
Molex Minifit-8
P3 46999-0567

Set CfgMX, Mtr, SDRVRn high to use with ClearPath (output to a Ch A input). Set low to use with a screwdriver (current-sense return). These are driven by the shift register chain.
As of rev F, DACV is a differential voltage centered around DAC VREF/2.

The output current is related to the DAC output voltage by the following equation:

\[ \text{mA} = \text{DACV} \times 9.671 \]

Therefore, with a reference of 2.5V, the required voltage by the following equation:

\[ \text{The output current is related to the DAC output centered around DAC VREF/2.} \]

As of rev F, DACV is a differential voltage centered around DAC VREF/2.

Therefore, with a reference of 2.5V, the required 11-bit value required for a given current is:

\[ \text{DATA0} = \text{mA} \times 84.664 \]

Full range is 0.0 - 24.1mA with a 2.5V reference.
6x High-Power IO

(i000 is on the Analog_Out page)

The fault output pulls low if ANY of the 4 output channels is shorted, or in an overtemp or overvoltage condition. When a channel is shorted, all other channels remain operating until a reset or power cycle. Any fault can be cleared by a reset or power cycle also.

The IO_0Ip and IO_0Ip lines are normally just held at Vsupply in the cases when the output is being used as a standard single-ended output. However, in full-bridge mode those lines are the other half of the differential output.
When an input’s associated CfgXX_AIN_DINn line is set high, the lower FET turns off, enabling a voltage divider that allows 0-10V analog input. When the line is set low, the upper BJT is on, enabling a 5V pull-up to allow open-collector digital inputs.

(The CfgXX_AIN_DINn lines are driven from the shift register chain, so they are 5V.)
The 5V short between pins 2 and 6 on each RJ45 protects against POE mode A. The GND short between pins 4 and 8 protects against mode B.
XBe Wireless

microSD Card

Associate LED

MicroSD (shell connections)
SPI Shift Register Chain for LEDs and hardware configuration

These go to the Analog_Digital In page. Set high to configure the associated input as analog (devide enabled), set low for digital (pull-up enabled).

ADI LEDs

DI LEDs

TTL RJ45 LEDs

USER LED

HPIO LEDs
Mounting Holes Etc

Spare testpoints

Fiducials

Mounting Points

MT1 Assembly mount point

MT2 Assembly mount point

MT3 Board-plate mount point

Center, near the USB connector

MT4 Mounting hole

Bottom right, near the PWR connector