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Motion Engineering, Inc.
33 South La Patera Lane
Santa Barbara, CA 93117-3214
ph (805) 681-3300
fax (805) 681-3311
tech@motioneng.com
www.motioneng.com

Release Note

OptoVME Daughterboard

P/N A009-0010 **Revision 4** **Dec 4 98**

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About the OptoVME

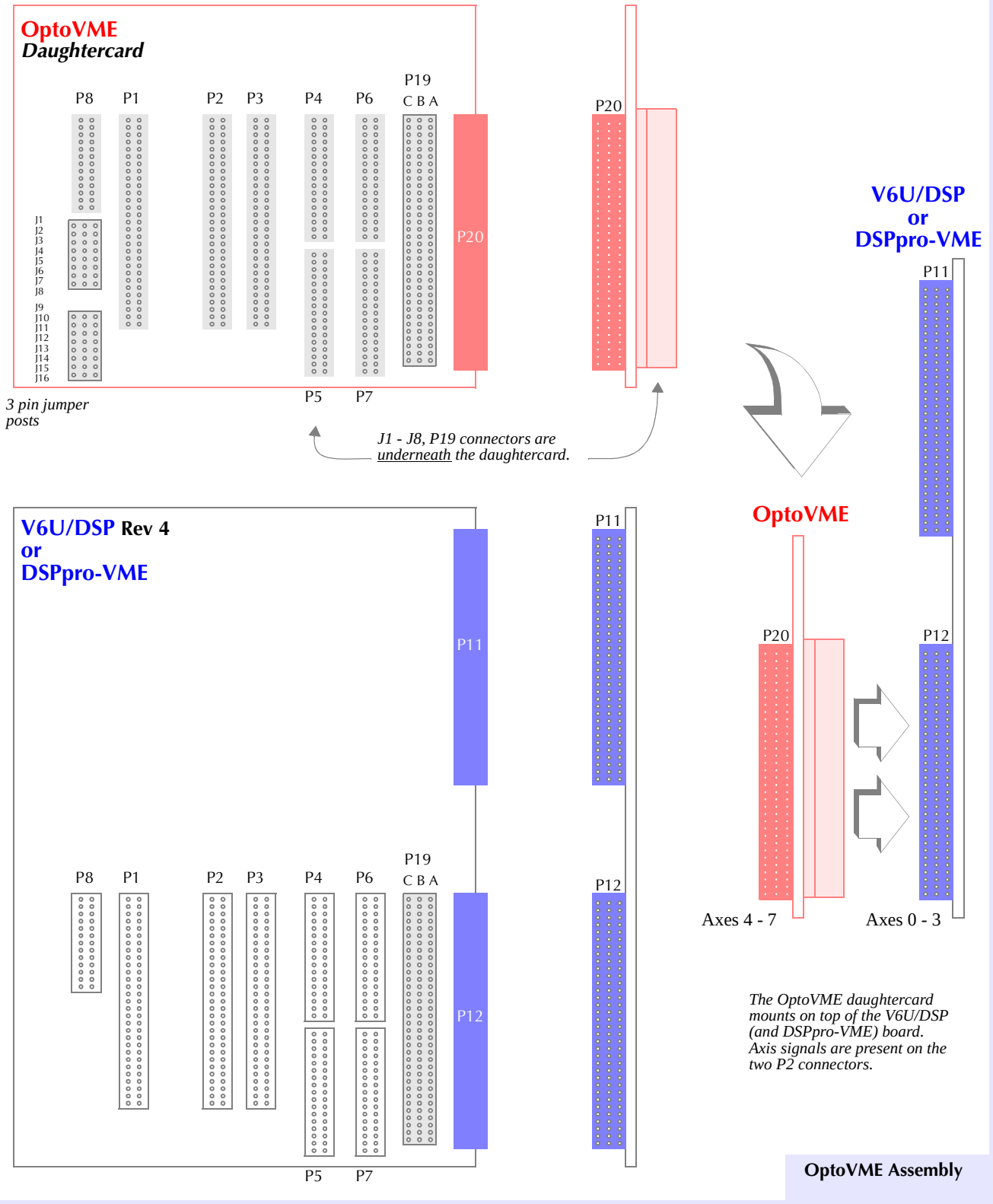
The OptoVME daughterboard provides opto-isolation for all 8 axes of the V6U/DSP and DSPpro-VME motion controllers, delivering the axis signals to the P2 connectors of the V6U/DSP (and DSPpro-VME). Note that to use the axis signals (opto-isolated or not) present on the P2 connectors, you will have to use a customized VME backplane.

The axis signals are rerouted from the V6U/DSP (and DSPpro-VME) controller up to the OptoVME, and then routed across to the OptoVME's P2 connector, with the remainder routed back down to the V6U/DSP (and DSPpro-VME), and onward to its P2 connector. Note that OptoVME is not a motion controller, but is simply a daughtercard option for the V6U/DSP and DSPpro-VME motion controllers.

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OptoVME & (V6U/DSP, DSPpro-VME) Assembly

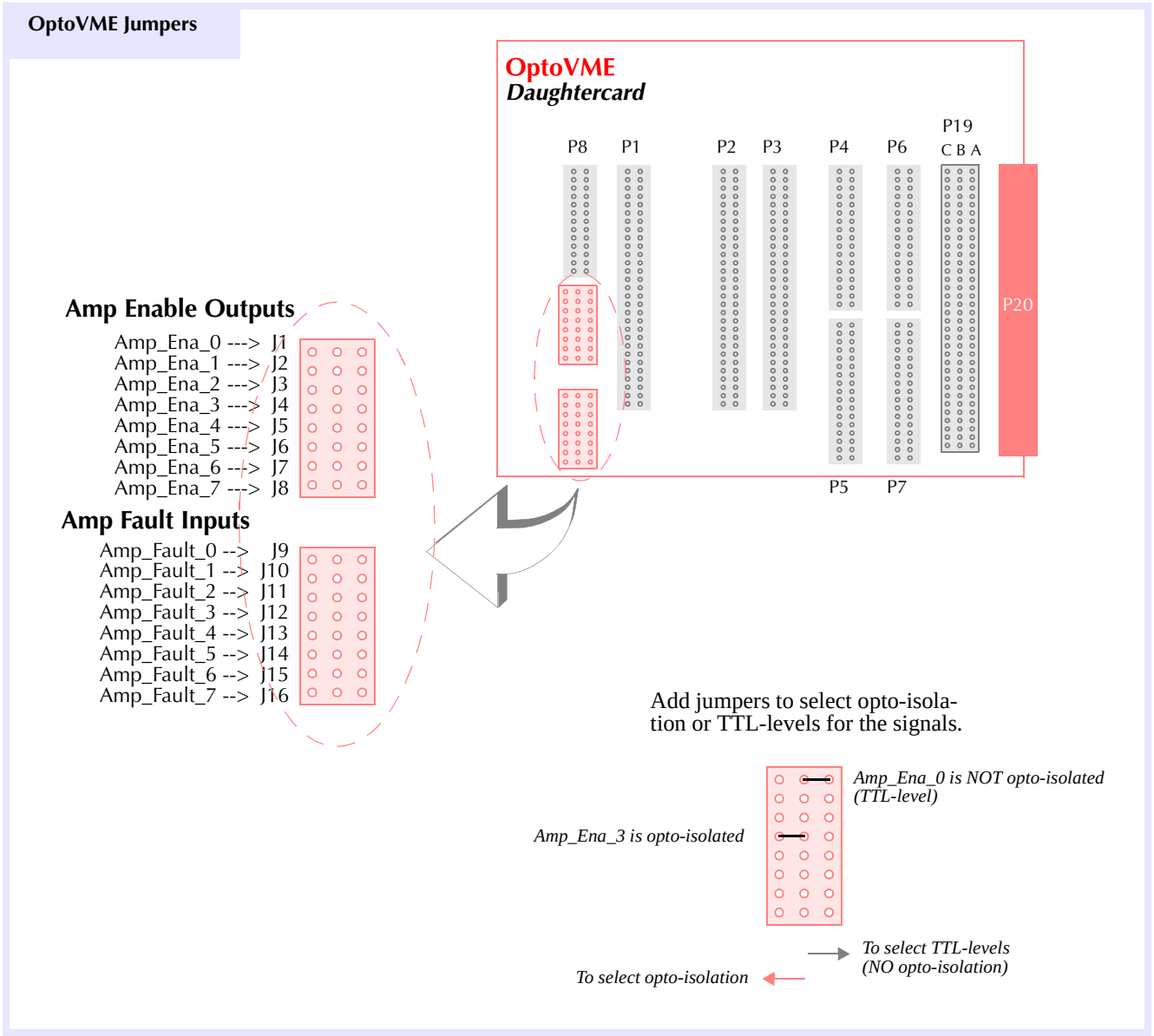
The OptoVME mounts directly on top of the V6U/DSP (or DSPproVME) circuit board, and the 2 board configuration requires 2 VME slots.



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Jumper Settings for OptoVME

There are 2 groups of jumper posts (J1 - J16) on the OptoVME circuit board (component side), which you use to configure the mode (opto-isolated or TTL-level) of the 8 Amp Enable output signals and the 8 Amp Fault input signals.

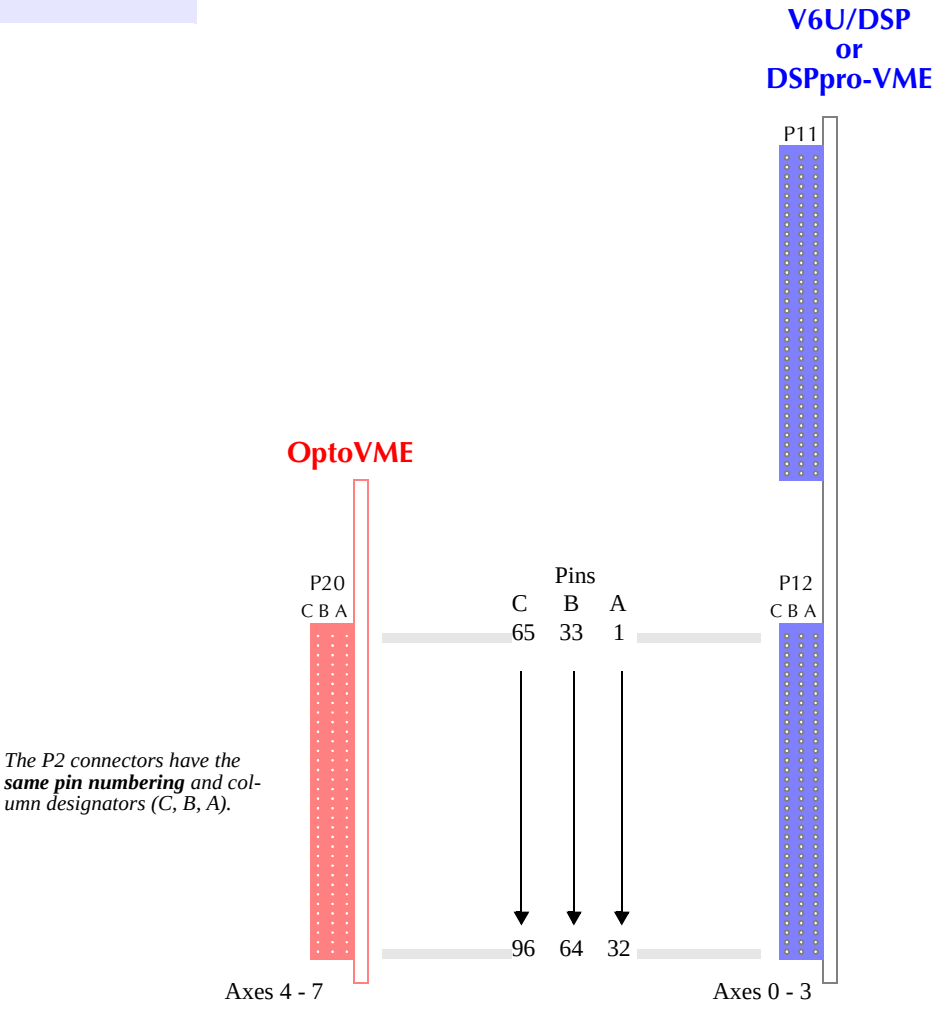


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Axis Connectors

The P2 connectors of the (V6U/DSP, DSPpro-VME) and the OptoVME are physically identical. The 96-pin connectors have 3 columns of pins, labeled C, B, and A.

P2 Connectors



*The P2 connectors have the **same pin numbering** and column designators (C, B, A).*

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(V6U/DSP, DSPpro-VME) P2 Connector

The (V6U/DSP, DSPpro-VME) P2 connector carries the signals for axes 0 - 3.

Table 1 (V6U/DSP, DSPpro-VME) P2 Connector

A	***Signal***	*B*	***Signal***	*C*	***Signal***
1	+5V	33	Step0	65	+5V
2	Encoder0_A	34	$\overline{\text{Step0}}$	66	Encoder2_A
3	$\overline{\text{Encoder0_A}}$	35	Dir0	67	$\overline{\text{Encoder2_A}}$
4	Encoder0_B	36	$\overline{\text{Dir0}}$	68	Encoder2_B
5	$\overline{\text{Encoder0_B}}$	37	Step1	69	$\overline{\text{Encoder2_B}}$
6	Index0	38	$\overline{\text{Step1}}$	70	Index2
7	$\overline{\text{Index0}}$	39	Dir1	71	$\overline{\text{Index2}}$
8	Gnd	40	$\overline{\text{Dir1}}$	72	Gnd
9	Analog_Out_0	41	Step2	73	Analog_Out_2
10	**Limit0_Pos_I**	42	$\overline{\text{Step2}}$	74	**Limit2_Pos_I**
11	**Limit0_Neg_I**	43	Dir2	75	**Limit2_Neg_I**
12	**Home0_Pin_I**	44	$\overline{\text{Dir2}}$	76	**Home2_Pin_I**
13	**Fault0_I**	45	Step3	77	**Fault2_I**
14	**Amp_Ena0_O**	46	$\overline{\text{Step3}}$	78	**Amp_Ena2_O**
15	**In_Pos0_O**	47	Dir3	79	**In_Pos2_O**
16	+5V	48	$\overline{\text{Dir3}}$	80	+5V
17	Encoder1_A	49	**PC7_I**	81	Encoder3_A
18	$\overline{\text{Encoder1_A}}$	50	**PC6_I**	82	$\overline{\text{Encoder3_A}}$
19	Encoder1_B	51	**PC5_I**	83	Encoder3_B
20	$\overline{\text{Encoder1_B}}$	52	**PC4_I**	84	$\overline{\text{Encoder3_B}}$
21	Index1	53	**PC3_I**	85	Index3
22	$\overline{\text{Index1}}$	54	**PC2_I**	86	$\overline{\text{Index3}}$
23	Gnd	55	**PC1_I**	87	Gnd
24	Analog_Out_1	56	**PC0_I**	88	Analog_Out_3
25	**Limit1_Pos_I**	57	**PB7_O**	89	**Limit3_Pos_I**
26	**Limit1_Neg_I**	58	**PB6_O**	90	**Limit3_Neg_I**
27	**Home1_Pin_I**	59	**PB5_O**	91	**Home3_Pin_I**
28	**Fault1_I**	60	**PB4_O**	92	**Fault3_I**
29	**Amp_Ena1_O**	61	Analog_In0	93	**Amp_Ena3_O**
30	**In_Pos1_O**	62	Analog_In1	94	**In_Pos3_O**
31	Gnd_U	63	Analog_In2	95	Gnd_U
32	+VUser	64	Analog_In3	96	+VUser

Signals that are in **bold** are opto-isolated. The Amp Enable outputs and Amp Fault inputs can be selected to be either TTL-level or opto-isolated, using the jumpers on the OptoVME board.

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OptoVME P2 Connector

The OptoVME P2 connector carries the signals for axes 4 - 7.

Table 2 OptoVME P2 Connector

A	Signal	B	Signal	C	Signal
1	+5V	33	Step4	65	+5V
2	Encoder4_A	34	$\overline{\text{Step4}}$	66	Encoder6_A
3	$\overline{\text{Encoder4_A}}$	35	Dir4	67	$\overline{\text{Encoder6_A}}$
4	Encoder4_B	36	$\overline{\text{Dir4}}$	68	Encoder6_B
5	$\overline{\text{Encoder4_B}}$	37	Step5	69	$\overline{\text{Encoder6_B}}$
6	Index4	38	$\overline{\text{Step5}}$	70	Index6
7	$\overline{\text{Index4}}$	39	Dir5	71	$\overline{\text{Index6}}$
8	Gnd	40	$\overline{\text{Dir5}}$	72	Gnd
9	Analog_Out_4	41	Step6	73	Analog_Out_6
10	**Limit4_Pos_I**	42	$\overline{\text{Step6}}$	74	**Limit6_Pos_I**
11	**Limit4_Neg_I**	43	Dir6	75	**Limit6_Neg_I**
12	**Home4_Pin_I**	44	$\overline{\text{Dir6}}$	76	**Home6_Pin_I**
13	**Fault4_I**	45	Step7	77	**Fault6_I**
14	**Amp_Ena4_O**	46	$\overline{\text{Step7}}$	78	**Amp_Ena6_O**
15	**In_Pos4_O**	47	Dir7	79	**In_Pos6_O**
16	+5V	48	$\overline{\text{Dir7}}$	80	+5V
17	Encoder5_A	49	**PA7_I**	81	Encoder7_A
18	$\overline{\text{Encoder5_A}}$	50	**PA6_I**	82	$\overline{\text{Encoder7_A}}$
19	Encoder5_B	51	**PA5_I**	83	Encoder7_B
20	$\overline{\text{Encoder5_B}}$	52	**PA4_I**	84	$\overline{\text{Encoder7_B}}$
21	Index5	53	**PA3_I**	85	Index7
22	$\overline{\text{Index5}}$	54	**PA2_I**	86	$\overline{\text{Index7}}$
23	Gnd	55	**PA1_I**	87	Gnd
24	Analog_Out_5	56	**PA0_I**	88	Analog_Out_7
25	**Limit5_Pos_I**	57	**PB3_O**	89	**Limit7_Pos_I**
26	**Limit5_Neg_I**	58	**PB2_O**	90	**Limit7_Neg_I**
27	**Home5_Pin_I**	59	**PB1_O**	91	**Home7_Pin_I**
28	**Fault5_I**	60	**PB0_O**	92	**Fault7_I**
29	**Amp_Ena5_O**	61	Analog_In4	93	**Amp_Ena7_O**
30	**In_Pos5_O**	62	Analog_In5	94	**In_Pos7_O**
31	Gnd_U	63	Analog_In6	95	Gnd_U
32	+VUser	64	Analog_In7	96	+VUser

Signals that are in **bold** are opto-isolated. The Amp Enable outputs and Amp Fault inputs can be selected to be either TTL-level or opto-isolated, using the jumpers on the OptoVME board.

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Signal Descriptions

The OptoVME option provides optical isolation for the Amp Enable, Amp Fault, In Position, Positive Limit, Negative limit, Home and User I/O signals from the VME/DSP motion controller. You must connect a power supply to the *+VUser* and *Gnd_U* inputs. This supply will power all of the opto-isolation circuits on the user side of the isolation barrier.

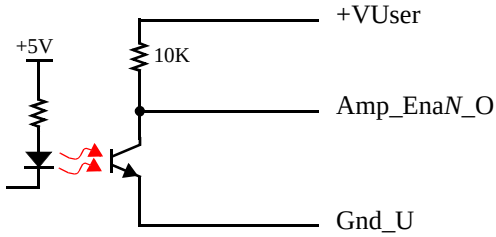
Each individual Amp Fault and Amp Enable signal can be individually configured to be optically isolated or TTL-compatible (no isolation) via board jumpers.

Amp Enable Outputs: Amp_Ena*N*_O (*N*= 0 - 7)

You use jumpers J1 - J8 to configure the Amp Enable outputs for either optical isolation or un-isolated TTL-level operation.

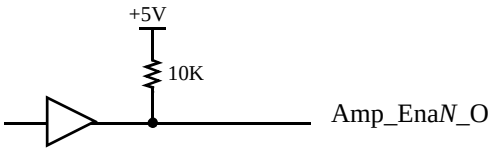
Amp Enable Outputs

Opto-isolated Mode



V_{CE} = 35V max
+VUser = +9V to +24V
V_{OL} = 0.2V @ I_L = 1 mA typical
I_{OL} = 25 mA max
I_{OH} = 100 nA typical

TTL Mode



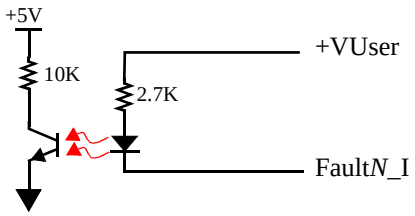
I_{OL} = 40 mA max
V_{OL} = 0.4V max @ I_O = 16 mA

Amp Fault Inputs: Fault*N*_I (*N*= 0 - 7)

You use jumpers J9 - J16 to configure the Amp Fault inputs for either optical isolation or un-isolated TTL-level operation.

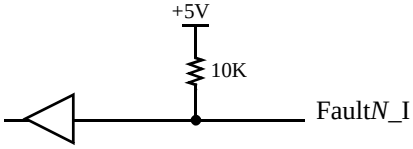
Amp Fault Inputs

Opto-isolated Mode



Input threshold voltage = 22V typical @ +VUser = +24V
Logic low input current = 0.3 mA min @ +VUser = +24V
+VUser = +9V to +24V

TTL Mode

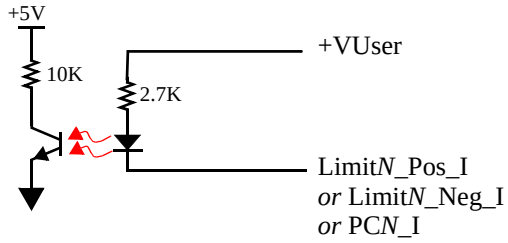


V_{IL} = 0.8V max
V_{IH} = 2.0V min
I_{IL} = -2.1 mA max

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Limit Inputs: Limit*N*_Pos_I, Limit*N*_Neg_I (*N*= 0 - 7)
User Inputs: PC*N*_I (*N*= 0 - 7)

Limit & User Inputs



Opto-isolated Mode

Input threshold voltage = 22V typical @ +VUser = +24V

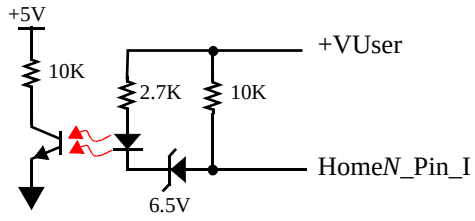
Logic low input current = 0.3 mA min @ +VUser = +24V

+VUser = +9V to +24V

Home Inputs: Home*N*_Pin_I (*N*= 0 - 7)

Home inputs use a blocking diode (6.5V Zener) to allow the use of Hall sensors as Home detectors. The blocking diode prevents Hall sensor leakage current form activating the Home input.

Home Inputs



Opto-isolated Mode

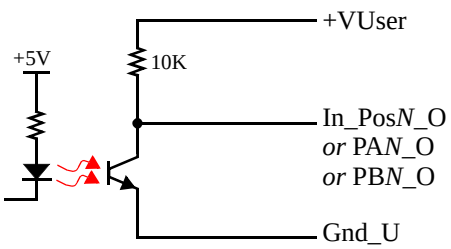
Input threshold voltage = 16V typical @ +VUser = +24V

Logic low input current = 1.5 mA min @ +VUser = +24V

+VUser = +9V to +24V

In Position Outputs: In_Pos*N*_O (*N*= 0 - 7)
User Outputs: PA*N*_O (*N*= 0 - 7)
PA*N*_O (*N*= 0 - 7)

In Position & User Outputs



Opto-isolated Mode

V_{CE} = 35V max

+VUser = +9V to +24V

V_{OL} = 0.2V @ I_L = 1 mA typical

I_{OL} = 25 mA max

I_{OH} = 100 nA typical

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