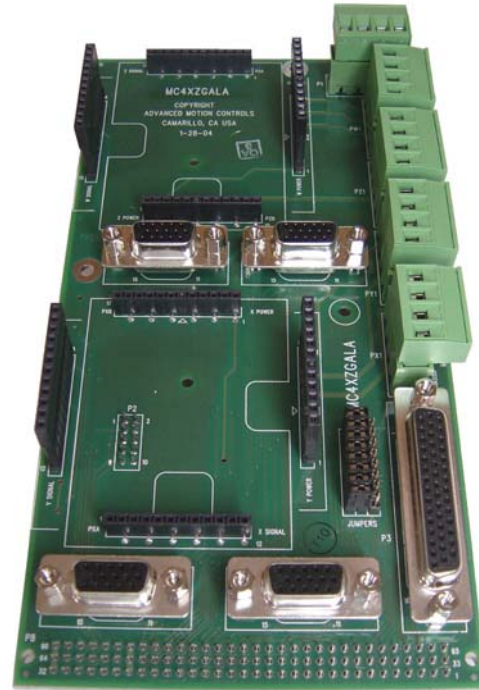


## MC4XZGAL MOUNTING CARD AMC Interface Board for Galil DMC-21x3

**FEATURES:**

- Mounts directly onto a Galil DMC-21x3
- Hosts up to 4-axis of Z Series amplifiers
- Pinouts correspond to Galil specifications
- Mating power connectors included
- Amplifier mounting kits included



**DESCRIPTION:**

The MC4XZGAL mounting card is designed to host up to four analog command Z Series servo amplifiers to interface directly with a Galil DMC-21x3 motion controller. The amplifiers are installed in stacked configurations to keep the overall footprint small while offering convenient pluggable screw terminals for easy power connections. High-density D-sub connectors are used for feedback and I/O interface. Amplifier mounting kits are included to secure the Z Series amplifiers onto the mounting card.

**SPECIFICATIONS:**

<b>MECHANICAL SPECIFICATIONS</b>	
POWER CONNECTOR*	4-position 5.08 mm spaced header
MOTOR CONNECTORS*	4-position 5.08 mm spaced header
FEEDBACK CONNECTORS*	15-position high-density D-sub
INPUT/OUTPUT CONNECTORS*	44-position high-density D-sub
SIZE (without amplifiers)	7.09 x 3.74 x 1.48 inches 180.0 x 95.0 x 37.5 mm
WEIGHT (with mating connectors installed)	6.6 oz 187.2 g

\* Mating connectors included

**JUMPERS:**

This mounting card allows control of external amplifiers by breaking out the necessary command signals through the high-density 44-pin D-sub connector (P3). These signals allow the user to command external motors (even different motor types) on another axis while still using the analog command Z Series amplifiers. The types of signals that are brought out are selected through the jumper settings. Note that each motor axis is associated with two jumpers that must be set the same way.

PIN	A	B	C
1	+REFW	PWM-IN / +REFW	PWM / STEPW
2	INHW	SIGN / AENW	SIGN / DIRW
3	+REFZ	PWM-IN / +REFZ	PWM / STEPZ
4	INHZ	SIGN / AENZ	SIGN / DIRZ
5	+REFY	PWM-IN / +REFY	PWM / STEPY
6	INH Y	SIGN / AENY	SIGN / DIRY
7	+REFX	PWM-IN / +REFX	PWM / STEPX
8	INH X	SIGN / AENX	SIGN / DIRX

- Notes: 1. Only use analog input Z Series drives (jumper the A's & B's)  
 2. PWM commands can be accessed through P3 (after jumpering B's to C's)

**PIN FUNCTIONS:**

CONNECTOR	PIN	NAME	DESCRIPTION / NOTES	I/O
<b>P1</b> Power	1	HV	DC voltage input	I
	2	GND	Ground	GND
	3	HV	DC voltage input	I
	4	GND	Ground	GND
<b>PX1</b> Motor X	1	MOTOR AX	Motor phase A connection for X-axis	O
	2	MOTOR BX	Motor phase B connection for X-axis	O
	3	MOTOR CX	Motor phase C connection for X-axis	O
	4	CHASSIS	Chassis	Chassis
<b>PY1</b> Motor Y	1	MOTOR AY	Motor phase A connection for Y-axis	O
	2	MOTOR BY	Motor phase B connection for Y-axis	O
	3	MOTOR CY	Motor phase C connection for Y-axis	O
	4	CHASSIS	Chassis	Chassis
<b>PZ1</b> Motor Z	1	MOTOR AZ	Motor phase A connection for Z-axis	O
	2	MOTOR BZ	Motor phase B connection for Z-axis	O
	3	MOTOR CZ	Motor phase C connection for Z-axis	O
	4	CHASSIS	Chassis	Chassis
<b>PW1</b> Motor W	1	MOTOR AW	Motor phase A connection for W-axis	O
	2	MOTOR BW	Motor phase B connection for W-axis	O
	3	MOTOR CW	Motor phase C connection for W-axis	O
	4	CHASSIS	Chassis	Chassis

CONNECTOR	PIN	NAME	DESCRIPTION / NOTES	I/O
<b>P4X</b> Motor X Feedback	1	ENCIX+	Differential Encoder I+	I
	2	ENCBX+	Differential Encoder B+	I
	3	ENCAX+	Differential Encoder A+	I
	4	ENCABX+	Differential Encoder AB+	I
	5	GND	Ground	GND
	6	ENCIX-	Differential Encoder I-	I
	7	ENCBX-	Differential Encoder B-	I
	8	ENCAX-	Differential Encoder A-	I
	9	ENCAAX-	Differential Encoder AA-	I
	10	HALL1X	Hall 1	I
	11	ENCAAX+	Differential Encoder AA+	I
	12	ENCABX-	Differential Encoder AB-	I
	13	HALL2X	Hall 2	I
	14	HALL3X	Hall 3	I
	15	5V Output	+5V Output for feedback devices	O
<b>P5Y</b> Motor Y Feedback	1	ENCYI+	Differential Encoder I+	I
	2	ENCBY+	Differential Encoder B+	I
	3	ENCAY+	Differential Encoder A+	I
	4	ENCABY+	Differential Encoder AB+	I
	5	GND	Ground	GND
	6	ENCYI-	Differential Encoder I-	I
	7	ENCBY-	Differential Encoder B-	I
	8	ENCAY-	Differential Encoder A-	I
	9	ENCAAY-	Differential Encoder AA-	I
	10	HALL1Y	Hall 1	I
	11	ENCAAY+	Differential Encoder AA+	I
	12	ENCABY-	Differential Encoder AB-	I
	13	HALL2Y	Hall 2	I
	14	HALL3Y	Hall 3	I
	15	5V Output	+5V Output for feedback devices	O

CONNECTOR	PIN	NAME	DESCRIPTION / NOTES	I/O
<b>P6Z</b> Motor Z Feedback	1	ENCIZ+	Differential Encoder I+	I
	2	ENCBZ+	Differential Encoder B+	I
	3	ENCAZ+	Differential Encoder A+	I
	4	ENCABZ+	Differential Encoder AB+	I
	5	GND	Ground	GND
	6	ENCIZ-	Differential Encoder I-	I
	7	ENCBZ-	Differential Encoder B-	I
	8	ENCAZ-	Differential Encoder A-	I
	9	ENCAAZ-	Differential Encoder AA-	I
	10	HALL1Z	Hall 1	I
	11	ENCAAZ+	Differential Encoder AA+	I
	12	ENCABZ-	Differential Encoder AB-	I
	13	HALL2Z	Hall 2	I
	14	HALL3Z	Hall 3	I
	15	5V Output	+5V Output for feedback devices	O
<b>P7W</b> Motor W Feedback	1	ENCIW+	Differential Encoder I+	I
	2	ENCBW+	Differential Encoder B+	I
	3	ENCAW+	Differential Encoder A+	I
	4	ENCABW+	Differential Encoder AB+	I
	5	GND	Ground	GND
	6	ENCIW-	Differential Encoder I-	I
	7	ENCBW-	Differential Encoder B-	I
	8	ENCAW-	Differential Encoder A-	I
	9	ENCAAW-	Differential Encoder AA-	I
	10	HALL1W	Hall 1	I
	11	ENCAAW+	Differential Encoder AA+	I
	12	ENCABW-	Differential Encoder AB-	I
	13	HALL2W	Hall 2	I
	14	HALL3W	Hall 3	I
	15	5V Output	+5V Output for feedback devices	O

CONNECTOR	PIN	NAME	DESCRIPTION / NOTES	I/O
P3 I/O	1	PWM-IN / +REFZ	* Z-axis Analog Command (or PWM Command)	O
	2	OUTPUT6	Output 6	O
	3	OUTPUT8	Output 8	O
	4	OUTPUT5	Output 5	O
	5	OUTPUT2	Output 2	O
	6	ABORT	Abort	I
	7	INPUT6	Input 6	I
	8	LATCHZ / INPUT3	Z-axis Latch or Input 3	I
	9	SIGN / AENY	* Y-axis Amp Enable (or Sign direction)	O
	10	Output Compare	Output Compare	O
	11	Reverse Limit X	X-axis Reverse limit	I
	12	Reverse Limit Y	Y-axis Reverse limit	I
	13	Reverse Limit Z	Z-axis Reverse limit	I
	14	Reverse Limit W	W-axis Reverse limit	I
	15	Forward Limit W	W-axis Forward limit	I
	16	SIGN / AENW	* W-axis Amp Enable (or Sign direction)	O
	17	SIGN / AENZ	* Z-axis Amp Enable (or Sign direction)	O
	18	OUTPUT7	Output 7	O
	19	OUTPUT4	Output 4	O
	20	OUTPUT1	Output 1	O
	21	OUTPUT3	Output 3	O
	22	INPUT7	Input 7	I
	23	LATCHW / INPUT4	W-axis Latch or Input 4	I
	24	LATCHX / INPUT1	X-axis Latch or Input 1	I
	25	PWM-IN / +REFX	* X-axis Analog Command (or PWM Command)	O
	26	HOMEX	X-axis Home	I
	27	HOMEY	Y-axis Home	I
	28	HOMEZ	Z-axis Home	I
	29	HOMEW	W-axis Home	I
	30	Error Output	Error Output	O
	31	PWM-IN / +REFW	* W-axis Analog Command (or PWM Command)	O
	32	5V Output	5V Output	O
	33	5V Output	5V Output	O
	34	GND	Ground	GND
	35	GND	Ground	GND
	36	INPUT8	Input 8	I
	37	INPUT5	Input 5	I
	38	LATCHY / INPUT2	Y-axis Latch or Input 2	I
	39	PWM-IN / +REFY	* Y-axis Analog Command (or PWM Command)	O
	40	SIGN / AENX	* X-axis Amp Enable (or Sign direction)	O
	41	Forward Limit X	X-axis Forward Limit	I
	42	Forward Limit Y	Y-axis Forward Limit	I
	43	Forward Limit Z	Z-axis Forward Limit	I
	44	RESET	Reset	I

\* Function depends on jumper setting

**INTERNAL CONNECTIONS:**

The following connectors are for interface between the components (Z Series amplifiers, MC4XZGAL, DMC-21x3) in the system. They are for your information and not intended for user interface.

**PXA, PXB – Z Series Connectors X**

PXA		PXB	
PIN	NAME	PIN	NAME
1	+REF	1	-
2	GROUND	2	GROUND
3	GROUND	3	
4	-	4	HIGH VOLTAGE
5	INHIBIT	5	
6	-	6	-
7	GROUND	7	MOTOR C
8	HALL 1	8	
9	HALL 2	9	MOTOR B
10	HALL 3	10	
11	-	11	MOTOR A
12	-	12	

**PYA, PYB – Z Series Connectors Y**

PYA		PYB	
PIN	NAME	PIN	NAME
1	+REF	1	-
2	GROUND	2	GROUND
3	GROUND	3	
4	-	4	HIGH
5	INHIBIT	5	
6	-	6	-
7	GROUND	7	MOTOR C
8	HALL 1	8	
9	HALL 2	9	MOTOR B
10	HALL 3	10	
11	-	11	MOTOR A
12	-	12	

**PZA, PZB – Z Series Connectors Z**

PZA		PZB	
PIN	NAME	PIN	NAME
1	+REF	1	-
2	GROUND	2	GROUND
3	GROUND	3	
4	-	4	HIGH VOLTAGE
5	INHIBIT	5	
6	-	6	-
7	GROUND	7	MOTOR C
8	HALL 1	8	
9	HALL 2	9	MOTOR B
10	HALL 3	10	
11	-	11	MOTOR A
12	-	12	

**PWA, PWB – Z Series Connectors W**

PWA		PWB	
PIN	NAME	PIN	NAME
1	+REF	1	-
2	GROUND	2	GROUND
3	GROUND	3	
4	-	4	HIGH
5	INHIBIT	5	
6	-	6	-
7	GROUND	7	MOTOR C
8	HALL 1	8	
9	HALL 2	9	MOTOR B
10	HALL 3	10	
11	-	11	MOTOR A
12	-	12	

**P2 - Auxiliary Encoder**

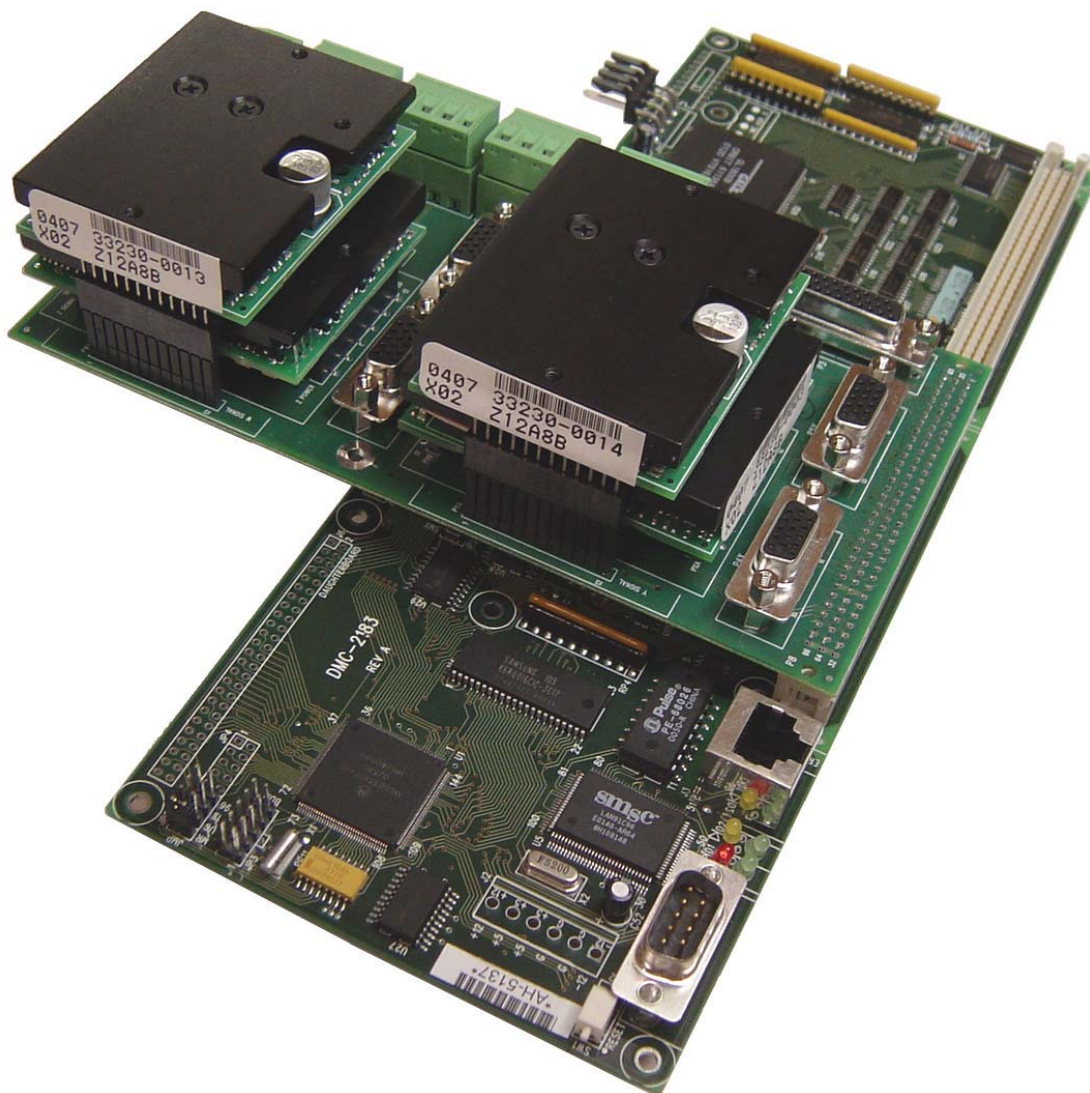
PIN	Row A	PIN	Row B
1	VCC	2	GND
3	ENCAAZ+	4	ENCAAZ-
5	ENCABZ+	6	ENCABZ-
7	ENCAAW+	8	ENCAAW-
9	ENCABW+	10	ENCABW-

## P8 – I/O Interface to Galil Controller

PIN	NAME	PIN	NAME
1	GND	49	OUTPUT7
2	PWM / STEPW	50	ENCAX-
3	PWM / STEPZ	51	ENCIX+
4	PWM / STEPY	52	ENCAY-
5	PWM / STEPX	53	ENCIY+
6	INHW	54	ENCAZ-
7	INHX	55	ENCIZ+
8	HOMEW	56	ENCAW-
9	HOMEZ	57	ENCIW+
10	HOMEY	58	GND
11	HOMEX	59	ENCAAX-
12	LATCHX / INPUT1	60	ENCAAY+
13	LATCHW / INPUT4	61	ENCABY-
14	INPUT7	62	ENCAAW+
15	OUTPUT3	63	RESET
16	OUTPUT5	64	5V Output
17	OUTPUT8	65	GND
18	ENCAX+	66	+REFW
19	ENCBX-	67	+REFZ
20	ENCAY+	68	+REFY
21	ENCBY-	69	+REFX
22	ENCAZ+	70	Output Compare
23	ENCBZ-	71	INHZ
24	ENCAW+	72	Forward Limit W
25	ENCBW-	73	Forward Limit Z
26	GND	74	Forward Limit Y
27	ENCAAX+	75	Forward Limit X
28	ENCABX-	76	LATCHZ / INPUT3
29	ENCABY+	77	INPUT6
30	ENCABZ+	78	ABORT
31	-12V Output	79	OUTPUT1
32	5V Output	80	OUTPUT4
33	GND	81	OUTPUT6
34	SIGN / DIRW	82	ENCBX+
35	SIGN / DIRZ	83	ENCIX-
36	SIGN / DIRY	84	ENCBY+
37	SIGN / DIRX	85	ENCIY-
38	GND	86	ENCBZ+
39	INHY	87	ENCIZ-
40	Reverse Limit W	88	ENCBW+
41	Reverse Limit Z	89	ENCIW-
42	Reverse Limit Y	90	GND
43	Reverse Limit X	91	ENCABX+
44	LATCHY / INPUT2	92	ENCAAY-
45	INPUT5	93	ENCAAZ+
46	INPUT8	94	Error Output
47	OUTPUT2	95	+12V Output
48	GND	96	5V Output

**CONFIGURATION ASSEMBLY:**

This photo shows four Z Series servo amplifiers installed on an MC4XZGAL mounting card, which is directly interfacing the Galil DMC-2183 motion controller. This can easily expand up to eight axes with the addition of one more MC4XZGAL mounting card and four more Z Series amplifiers.

**ORDERING INFORMATION:**

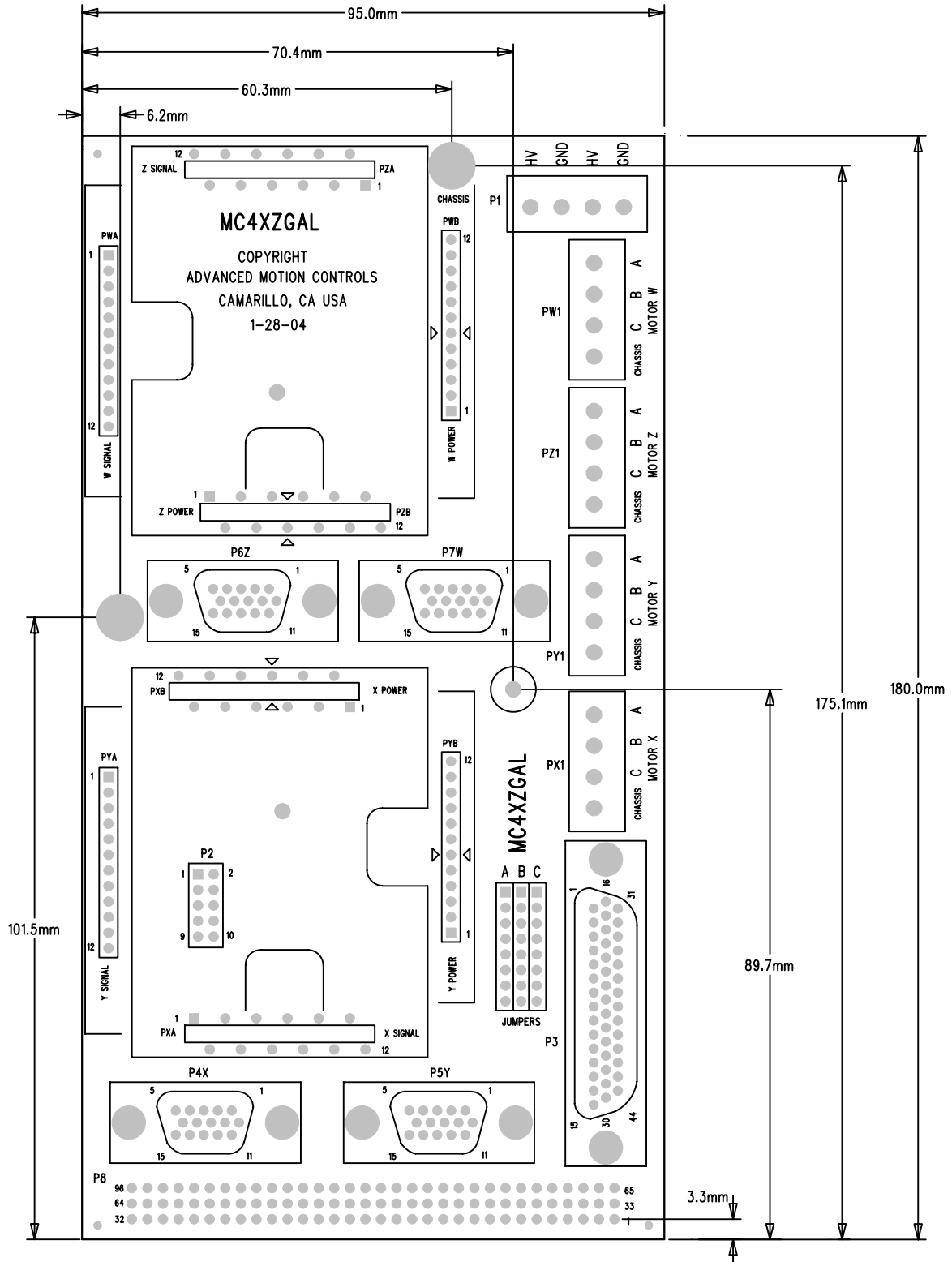
Model: MC4XZGALX

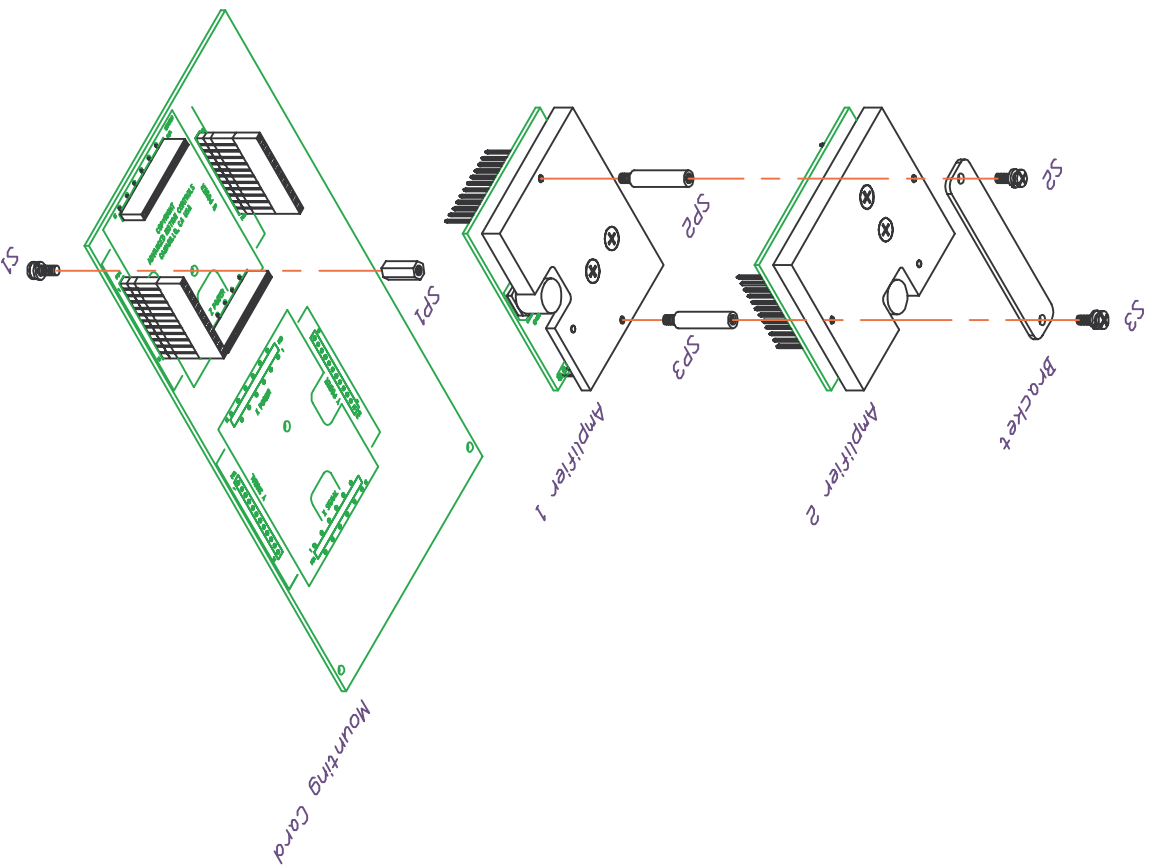
X (at the end) indicates current revision letter

Only use this mounting card with analog input Z Series servo amplifiers.  
(Examples: ZB12A8, ZB6A6, Z12A8, Z6A6)

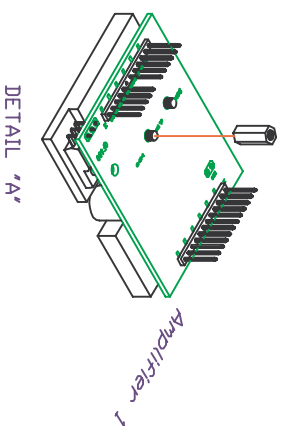
MOUNTING DIMENSIONS

MC4XZGAL Series





- PARTS LIST:
- S1-S3; #4-40 X 1/4 panhead phillips screw w/lockwasher,
  - SP1; 3/16 Hex X 7/16 4-40 thread F/F nylon standoff,
  - (reference Amatom p/n 8105-N-0440)
  - SP2-SP3; 3/16 Round X 3/4 4-40 thread M/F nylon standoff,
  - (reference Amatom p/n 9732-N-0440)
  - Bracket; AMC p/n MBK003A.



- ASSEMBLY SEQUENCE:
1. Install SP1 to baseplate mounting screw of Amp 1. See Detail "A".
  2. Install Amp 1 to mounting card (note orientation) using S1.
  3. Install SP2,SP3 to baseplate of Amp 1.
  4. Install Amp 2 to mounting card (note orientation).
  5. Install bracket to SP2,SP3 using S2,S3.