EPCIO-601-2
Hardware User Manual

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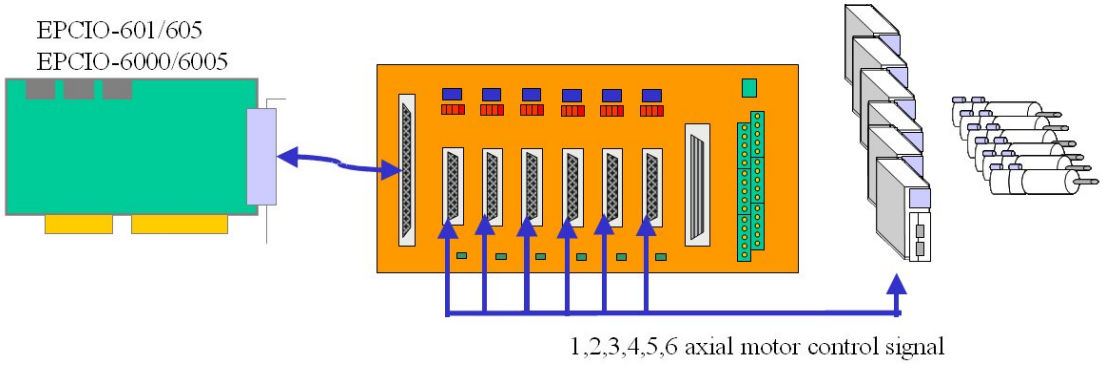
Chapter 1 Overview

1.1 Introduction

The EPCIO-601-2 is a six-axis dedicated adapter card used in the Panasonic MINAS AC series servo drive and developed by the Mechanical and Systems Laboratory of Industrial Technology Research Institute (MSL). The EPCIO-601-2 can connect the servo driver to a six-axis motion control card such as the EPCIO-601/605 or EPCIO-6000/6005, simplifying the adaption between peripheral devices during the wiring process.

1.2 System Connection Diagram



1.3 Parts List

The EPCIO-601-2 package includes:

- An EPCIO-601-2 Dedicated Adapter Card
- The Users Manual
- An SCSI-II 100 Pin Adapter Cable
- A 2-Pin Terminal Female Socket (Pitch 5 mm, connects externally to a 24 volt electrical source)

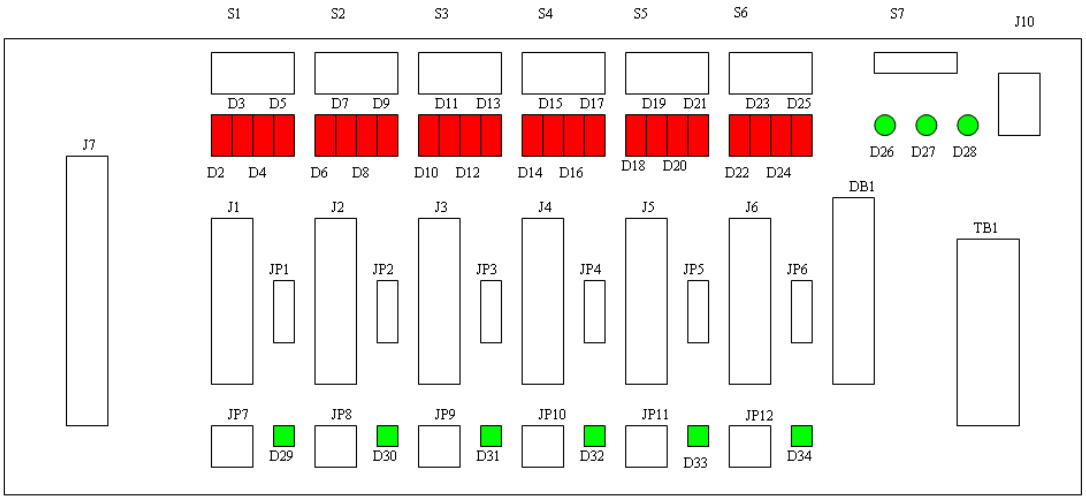
Before removing the EPCIO-601-2 dedicated Adapter Card from the anti-static bag, please execute the following steps to avoid electrostatic damage:

- Rid your body of static electricity (wear a grounded wrist strap or lightly touch the metal exterior of a computer with your hand)
- Prior to opening the anti-static bag, lightly touch the anti-static bag to the metal exterior of a computer
- When removing the EPCIO-601-2 dedicated Adapter Card, avoid touching the top of the circuits or components

After removing the EPCIO-601-2 from its package, please examine the adapter card for any obvious damage caused by external forces (lost, deformed, or damaged parts). If such damage is discovered, please stop the installation process, return the EPCIO-601-2 to the anti-static bag and immediately contact customer service or the retailer.

Chapter 2 Internal Components

2.1 EPCIO-601-2 Component Positioning



2.2 Primary Connector (J7-SCSI II)

(1) Pin Definitions

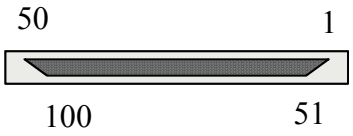
Pin Definitions for SCSI II-100PIN CONNECTOR			
PIN Definitions	**PIN No.**	**PIN No.**	**PIN Definitions**
AGND	1	51	AGND
DAC1	2	52	DAC4
DAC2	3	53	DAC5
DAC3	4	54	DAC6
+5 V	5	55	COM-
COM+	6	56	COM-
COM (internal COM+)	7	57	ESTP
COM (internal COM+)	8	58	PRDY
HOM1	9	59	HOM2
OT1+	10	60	OT2+
OT1-	11	61	OT2-
SVON1	12	62	SVON2
HOM3	13	63	HOM4
OT3+	14	64	OT4+
OT3-	15	65	OT4-
SVON3	16	66	SVON4
HOM5	17	67	HOM6
OT5+	18	68	OT6+
OT5-	19	69	OT6-
SVON5	20	70	SVON6
EA1+	21	71	EA2+
EA1-	22	72	EA2-
EB1+	23	73	EB2+
EB1-	24	74	EB2-
EC1+	25	75	EC2+
EC1-	26	76	EC2-
EA3+	27	77	EA4+
EA3-	28	78	EA4-
EB3+	29	79	EB4+
EB3-	30	80	EB4-
EC3+	31	81	EC4+
EC3-	32	82	EC4-
EA5+	33	83	EA6+
EA5-	34	84	EA6-
EB5+	35	85	EB6+
EB5-	36	86	EB6-
EC5+	37	87	EC6+
EC5-	38	88	EC6-
PA1+	39	89	PA2+
PA1-	40	90	PA2-
PB1+	41	91	PB2+
PB1-	42	92	PB2-
PA3+	43	93	PA4+
PA3-	44	94	PA4-
PB3+	45	95	PB4+
PB3-	46	96	PB4-
PA5+	47	97	PA6+
PA5-	48	98	PA6-
PB5+	49	99	PB6+
PB5-	50	100	PB6-

Note: COM is already connected internally in the adapter card to COM+, 24 V. COM+ connects to a 24 V electrical source, and COM- connects to a 24 V ground. Additionally, AGND is independent from COM-.

(2) Functions

The primary connector (J7) must pass through an SCSI-II 100 pin cable to connect to an SCSI-II 100 pin connector on a six-axis control card, such as the EPCIO-601/605 or the EPCIO-6000/6005. For the connection method, please refer to the diagram in section 1.2 - System Connection Diagram.

(3) Pins



2.3 Servo Connectors for Each Axis (J1, J2, J3, J4, J5, J6)

(1) Definitions and Functions for J1 Pins

J1 to J6 are six 36-pin connectors that can directly connect one-to-one with the Panasonic Minas AC servo drive, thereby avoiding complicated wiring.

Pin	J1 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC1+	Z+	J7.25	--	Group 1 encoder input. Positive terminal of Z phase differential signals
2	EC1-	Z-	J7.26	--	Group 1 encoder input. Negative terminal of Z phase differential signals
3					
4					
5	PA1-	PULSE-	J7.40	AGND	Group 1 pulse output. Negative terminal of A phase differential signals
6	PA1+	PULSE+	J7.39	AGND	Group 1 pulse output. Positive terminal of A phase differential signals
7	PB1-	SIGN-	J7.42	AGND	Group 1 pulse output. Negative terminal of B phase differential signals
8	PB1+	SIGN+	J7.41	AGND	Group 1 pulse output. Positive terminal of B phase differential signals
9	COM-	INH (COM-)	J7.55	--	"Input Inhibition" is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	"Speed Zero Clamp" is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON1	SERVO_ON	J7.12	COM-	Servo-on signal
13					
14	DAC1/Floating	V_CMD	J7.2	AGND	Connectting to "Velocity Control Mode Input" of the Panasonic servo drive, and JP1 set DAC1 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA1+	A+	J7.21	--	Group 1 encoder input. Positive terminal of A phase differential signals
20	EA1-	A-	J7.22	--	Group 1 encoder input. Negative terminal of A phase differential signals
21	EB1+	B+	J7.23	--	Group 1 encoder input. Positive terminal of B phase differential signals
22	EB1-	B-	J7.24	--	Group 1 encoder input. Negative terminal of B phase differential signals
23					
24					
25					
26					
27	S_RDY1	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	"CW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	"CCW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE1	C_MODE	--	--	Connect to "Control Mode Switch Output" of the Panasonic servo drive
33					
34	DAC1/Floating	T_CMD	J7.2	AGND	Connect to "Torque Control Mode Input" of the Panasonic servo drive, and JP1 set DAC1 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

(2) Definition and Functions for J2 Pins

Pin	J2 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC2+	Z+	J7.75	--	Group 2 encoder input . Positive terminal of Z phase differential signals.
2	EC2-	Z-	J7.76	--	Group 2 encoder input. Negative terminal of Z phase differential signals.
3					
4					
5	PA2-	PULSE-	J7.90	AGND	Group 2 pulse output. Negative terminal of A phase differential signals.
6	PA2+	PULSE+	J7.89	AGND	Group 2 pulse output. Positive terminal of A phase differential signals.
7	PB2-	SIGN-	J7.92	AGND	Group 2 pulse output. Negative terminal of B phase differential signals.
8	PB2+	SIGN+	J7.91	AGND	Group 2 pulse output. Positive terminal of B phase differential signals.
9	COM-	INH (COM-)	J7.55	--	“Input Inhibition” is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	“Speed Zero Clamp” is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON2	SERVO_ON	J7.62	COM-	Servo-on signal
13					
14	DAC2/Floating	V_CMD	J7.3	AGND	Connectting to “Velocity Control Mode Input” of the Panasonic servo drive, and JP2 set DAC2 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA2+	A+	J7.71	--	Group 2 encoder input. Positive terminal of A phase differential signals.
20	EA2-	A-	J7.72	--	Group 2 encoder input. Negative terminal of A phase differential signals.
21	EB2+	B+	J7.73	--	Group 2 encoder input. Positive terminalof B phase differential signals.
22	EB2-	B-	J7.74	--	Group 2 encoder input. Negative terminal of B phase differential signals.
23					
24					
25					
26					
27	S_RDY2	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	“CW Output Inhibition” is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	“CCW Output Inhibition” is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE2	C_MODE	--	--	Connect to “Control Mode Switch Output” of the Panasonic servo drive
33					
34	DAC2/Floating	T_CMD	J7.3	AGND	Connect to “Torque Control Mode Input” of the Panasonic servo drive, and JP2 set DAC2 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

(3) Definition and Functions for J3 Pin

Pin	J3 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC3+	Z+	J7.31	--	Group 3 encoder input. Positive terminal of Z phase differential signals
2	EC3-	Z-	J7.32	--	Group 3 encoder input. Negative terminal of Z phase differential signals
3					
4					
5	PA3-	PULSE-	J7.44	AGND	Group 3 pulse output. Negative terminal of A phase differential signals
6	PA3+	PULSE+	J7.43	AGND	Group 3 pulse output. Positive terminal of A phase differential signals
7	PB3-	SIGN-	J7.46	AGND	Group 3 pulse output. Negative terminal of B phase differential signals
8	PB3+	SIGN+	J7.45	AGND	Group 3 pulse output. Positive terminal of B phase differential signals
9	COM-	INH (COM-)	J7.55	--	"Input Inhibition" is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	"Speed Zero Clamp" is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON3	SERVO_ON	J7.16	COM-	Servo-on signal
13					
14	DAC3/Floating	V_CMD	J7.4	AGND	Connectting to "Velocity Control Mode Input" of the Panasonic servo drive, and JP3 set DAC3 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA3+	A+	J7.27	--	Group 3 encoder input. Positive terminal of A phase differential signals
20	EA3-	A-	J7.28	--	Group 3 encoder input. Negative terminal of A phase differential signals
21	EB3+	B+	J7.29	--	Group 3 encoder input. Positive terminal of B phase differential signals
22	EB3-	B-	J7.30	--	Group 3 encoder input. Negative terminal of B phase differential signals
23					
24					
25					
26					
27	S_RDY3	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	"CW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	"CCW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE3	C_MODE	--	--	Connect to "Control Mode Switch Output" of the Panasonic servo drive
33					
34	DAC3/Floating	T_CMD	J7.4	AGND	Connect to "Torque Control Mode Input" of the Panasonic servo drive, and JP3 set DAC3 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

(4) Definition and Functions for J4 Pins

Pin	J4 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC4+	Z+	J7.81	--	Group 4 encoder input. Positive terminal of Z phase differential signals.
2	EC4-	Z-	J7.82	--	Group 4 encoder input. Negative terminal of Z phase differential signals.
3					
4					
5	PA4-	PULSE-	J7.94	AGND	Group 4 pulse output. Negative terminal of A phase differential signals.
6	PA4+	PULSE+	J7.93	AGND	Group 4 pulse output. Positive terminal of A phase differential signals.
7	PB4-	SIGN-	J7.96	AGND	Group 4 pulse output. Negative terminal of B phase differential signals.
8	PB4+	SIGN+	J7.95	AGND	Group 4 pulse output. Positive terminal of B phase differential signals.
9	COM-	INH (COM-)	J7.55	--	"Input Inhibition" is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	"Speed Zero Clamp" is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON4	SERVO_ON	J7.66	COM-	Servo-on signal
13					
14	DAC4/Floating	V_CMD	J7.52	AGND	Connectting to "Velocity Control Mode Input" of the Panasonic servo drive, and JP4 set DAC4 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA4+	A+	J7.77	--	Group 4 encoder input. Positive terminal of A phase differential signals.
20	EA4-	A-	J7.78	--	Group 4 encoder input. Negative terminal of A phase differential signals.
21	EB4+	B+	J7.79	--	Group 4 encoder input. Positive terminal of B phase differential signals.
22	EB4-	B-	J7.80	--	Group 4 encoder input. Negative terminal of B phase differential signals.
23					
24					
25					
26					
27	S_RDY4	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	"CW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	"CCW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE4	C_MODE	--	--	Connect to "Control Mode Switch Output" of the Panasonic servo drive
33					
34	DAC4/Floating	T_CMD	J7.52	AGND	Connect to "Torque Control Mode Input" of the Panasonic servo drive, and JP4 set DAC4 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

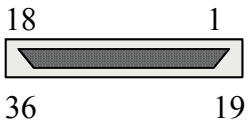
(5) Definition and Functions for J5 Pins

Pin	J5 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC5+	Z+	J7.37	--	Group 5 encoder input. Positive terminal of Z phase differential signals
2	EC5-	Z-	J7.38	--	Group 5 encoder input. Negative terminal of Z phase differential signals
3					
4					
5	PA5-	PULSE-	J7.48	AGND	Group 5 pulse output. Negative terminal of A phase differential signals
6	PA5+	PULSE+	J7.47	AGND	Group 5 pulse output. Positive terminal of A phase differential signals
7	PB5-	SIGN-	J7.50	AGND	Group 5 pulse output. Negative terminal of B phase differential signals
8	PB5+	SIGN+	J7.49	AGND	Group 5 pulse output. Positive terminal of B phase differential signals
9	COM-	INH (COM-)	J7.55	--	"Input Inhibition" is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	"Speed Zero Clamp" is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON5	SERVO_ON	J7.20	COM-	Servo-on signal
13					
14	DAC5/Floating	V_CMD	J7.53	AGND	Connectting to "Velocity Control Mode Input" of the Panasonic servo drive, and JP5 set DAC5 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA5+	A+	J7.33	--	Group 5 encoder input. Positive terminal of A phase differential signals
20	EA5-	A-	J7.34	--	Group 5 encoder input. Negative terminal of A phase differential signals
21	EB5+	B+	J7.35	--	Group 5 encoder input. Positive terminal of B phase differential signals
22	EB5-	B-	J7.36	--	Group 5 encoder input. Negative terminal of B phase differential signals
23					
24					
25					
26					
27	S_RDY5	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	"CW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	"CCW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE5	C_MODE	--	--	Connect to "Control Mode Switch Output" of the Panasonic servo drive
33					
34	DAC5/Floating	T_CMD	J7.53	AGND	Connect to "Torque Control Mode Input" of the Panasonic servo drive, and JP5 set DAC5 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

(6) Definition and Functions for J6 Pins

Pin	J6 Definitions	Corresponding Panasonic Socket Definitions	Signal Flow	Reference Point	Explanation of Function
1	EC6+	Z+	J7.87	--	Group 6 encoder input. Positive terminal of Z phase differential signals.
2	EC6-	Z-	J7.88	--	Group 6 encoder input. Negative terminal of Z phase differential signals.
3					
4					
5	PA6-	PULSE-	J7.98	AGND	Group 6 pulse output. Negative terminalof A phase differential signals.
6	PA6+	PULSE+	J7.97	AGND	Group 6 pulse output. Positive terminal of A phase differential signals.
7	PB6-	SIGN-	J7.100	AGND	Group 6 pulse output. Negative terminal of B phase differential signals.
8	PB6+	SIGN+	J7.99	AGND	Group 6 pulse output. Positive terminal of B phase differential signals.
9	COM-	INH (COM-)	J7.55	--	"Input Inhibition" is disabled when COM- is connected to the Panasonic servo drive
10	COM-	ZEROSP (COM-)	J7.55	--	"Speed Zero Clamp" is disable when COM- is connected to the Panasonic servo drive
11	COM+	COM+	J7.6	COM-	+24 V output
12	SVON6	SERVO_ON	J7.70	COM-	Servo-on signal
13					
14	DAC6/Floating	V_CMD	J7.54	AGND	Connectting to "Velocity Control Mode Input" of the Panasonic servo drive, and JP6 set DAC6 to connect to Pin 14 or 34
15	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
16					
17					
18	FG	FG	--	--	Frame ground
19	EA6+	A+	J7.83	--	Group 6 encoder input. Positive terminal of A phase differential signals.
20	EA6-	A-	J7.84	--	Group 6 encoder input. Negative terminal of A phase differential signals.
21	EB6+	B+	J7.85	--	Group 6 encoder input. Positive terminal of B phase differential signals.
22	EB6-	B-	J7.86	--	Group 6 encoder input. Negative terminal of B phase differential signals.
23					
24					
25					
26					
27	S_RDY6	S_RDY	--	COM-	SERVO RDY signal sent from drive
28	COM-	COM-	J7.55	--	+24 V ground
29	COM-	CWL	J7.55	--	"CW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
30	COM-	CCWL	J7.55	--	"CCW Output Inhibition" is disabled when COM- is connected to the Panasonic servo drive
31					
32	C_MODE6	C_MODE	--	--	Connect to "Control Mode Switch Output" of the Panasonic servo drive
33					
34	DAC6/Floating	T_CMD	J7.54	AGND	Connect to "Torque Control Mode Input" of the Panasonic servo drive, and JP6 set DAC6 to connect to Pin 14 or 34
35	AGND	AGND	J7.1	--	Reference terminal for pulse and DAC output voltage
36					

(7) Pins



2.4 Terminal Block—TB1

(1) Pin Definitions

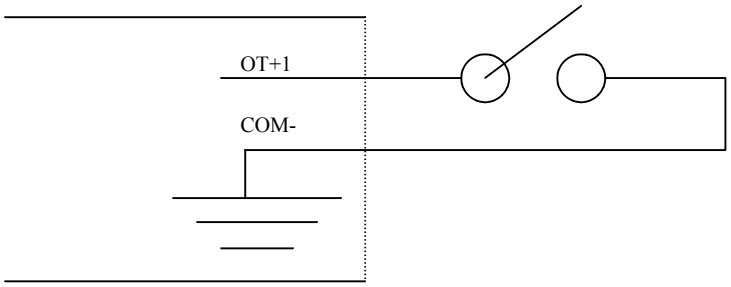
Definitions	Printed Text	Pin	Pin	Printed Text	Definitions
NC	NC	29	30	NC	NC
COM-	GD	27	28	STOP	ESTP
RDY+	RDY+	25	26	RDY-	RDY-
HOM6	HOM6	23	24	OT-6	OT6-
COM-	GD	21	22	OT+6	OT6+
HOM5	HOM5	19	20	OT-5	OT5-
COM-	GD	17	18	OT+5	OT5+
HOM4	HOM4	15	16	OT-4	OT4-
COM-	GD	13	14	OT+4	OT4+
HOM3	HOM3	11	12	OT-3	OT3-
COM-	GD	9	10	OT+3	OT3+
HOM2	HOM2	7	8	OT-2	OT2-
COM-	GD	5	6	OT+2	OT2+
HOM1	HOM1	3	4	OT-1	OT1-
COM-	GD	1	2	OT+1	OT1+

(2) Explanation of Definitions

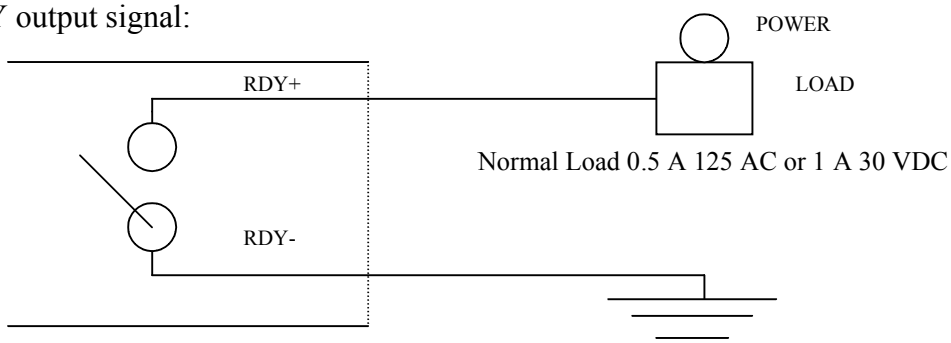
Pin	Definitions	Signal Flow	Electrical Flow	Reference Point	Explanation of Function
1	COM-	24 V ground	--	--	24 V ground
2	OT1+	J7.10	Outflow	COM-	Group 1 positive over-travel limit switch input
3	HOM1	J7.9	Outflow	COM-	Group 1 home switch input
4	OT1-	J7.11	Outflow	COM-	Group 1 negative over-travel limit switch input
5	COM-	24 V ground	--	--	24 V ground
6	OT2+	J7.60	Outflow	COM-	Group 2 positive over-travel limit switch input
7	HOM2	J7.59	Outflow	COM-	Group 2 home switch input
8	OT2-	J7.61	Outflow	COM-	Group 2 negative over-travel limit switch input
9	COM-	24 V ground	--	--	24 V ground
10	OT3+	J7.14	Outflow	COM-	Group 3 positive over-travel limit switch input
11	HOM3	J7.13	Outflow	COM-	Group 3 home switch input
12	OT3-	J7.15	Outflow	COM-	Group 3 negative over-travel limit switch input
13	COM-	24 V ground	--	--	24 V ground
14	OT4+	J7.64	Outflow	COM-	Group 4 positive over-travel limit switch input
15	HOM4	J7.63	Outflow	COM-	Group 4 home switch input
16	OT4-	J7.65	Outflow	COM-	Group 4 negative over-travel limit switch input
17	COM-	24 V ground	--	--	24 V ground
18	OT5+	J7.18	Outflow	COM-	Group 5 positive over-travel limit switch input
19	HOM5	J7.17	Outflow	COM-	Group 5 home switch input
20	OT5-	J7.19	Outflow	COM-	Group 5 negative over-travel limit switch input
21	COM-	24 V ground	--	--	24 V ground
22	OT6+	J7.68	Outflow	COM-	Group 6 positive over-travel limit switch input
23	HOM6	J7.67	Outflow	COM-	Group 6 home switch input
24	OT6-	J7.69	Outflow	COM-	Group 6 negative over-travel limit switch input
25	RDY+	(PRDY -J7.58)	RELAY Output	--	Position Ready (PRDY) output connection point; when the Position Ready (PRDY) output is transmitted, RELAY is closed
26	RDY-				
27	COM-	24 V ground	--	--	24 V ground
28	ESTP	J7.57	Outflow	COM-	Emergency stop input connection point
29	NC				
30	NC				

(3) Suggested Wiring Method

STOP and HOME, OT+, and OT- input signals for the six axes:



RDY output signal:



2.5 Terminal Block–J10

(1) Pin Definitions

1	DGND (COM-)
2	+24 V (COM+)

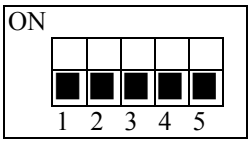
(2) Explanation of Definitions

The external +24 V power supply, +24 V, and DGND each connect to the positive and negative terminals of the +24 V electrical supply input. The +24 V electrical supply is internally connected to COM+ and COM. The 24 V electrical supply is internally connected to COM-.

Pin	Name	Ref. Point	Explanation
1	DGND	--	The negative terminal of the external 24 V electrical supply input
2	+24 V	COM-	The positive terminal of the external 24 V electrical supply input

2.6 Simulation Switches–S1, S2, S3, S4, S5, S6

(1) Switch Definitions and Default Value Settings



S1 Switch	1	2	3	4	5
Definition	HOM1	OT1+	OT1-	MODE1	SVON1
Printed Text	HOM1	OT+1	OT-1	MOD1	INH1
Default	OFF	OFF	OFF	OFF	OFF

S2 Switch	1	2	3	4	5
Definition	HOM2	OT2+	OT2-	MODE2	SVON2
Printed Text	HOM2	OT+2	OT-2	MOD2	INH2
Default	OFF	OFF	OFF	OFF	OFF

S3 Switch	1	2	3	4	5
Definition	HOM3	OT3+	OT3-	MODE3	SVON3
Printed Text	HOM3	OT+3	OT-3	MOD3	INH3
Default	OFF	OFF	OFF	OFF	OFF

S4 Switch	1	2	3	4	5
Definition	HOM4	OT4+	OT4-	MODE4	SVON4
Printed Text	HOM4	OT+4	OT-4	MOD4	INH4
Default	OFF	OFF	OFF	OFF	OFF

S5 Switch	1	2	3	4	5
Definition	HOM5	OT5+	OT5-	MODE5	SVON5
Printed Text	HOM5	OT+5	OT-5	MOD5	INH5
Default	OFF	OFF	OFF	OFF	OFF

S6 Switch	1	2	3	4	5
Definition	HOM6	OT6+	OT6-	MODE6	SVON6
Printed Text	HOM6	OT+6	OT-6	MOD6	INH6
Default	OFF	OFF	OFF	OFF	OFF

(2) Explanation of Functions and Settings

HOM: Used in parallel with TB1. If the TB1 Home connection point has an external Home Switch, it should be set to the OFF position. If there is no external Home Switch, this dip switch can function as the Home Switch; a dip switch set to ON indicates that the Home Switch signal for the given axis is connected.

OT+: Used in parallel with TB1. If the TB1 OT+ connection point has an external Limit Switch, it should be set to the OFF position. If there is no external Limit Switch, this dip switch can function as the Limit Switch; a dip switch set to ON indicates that the positive over travel Limit Switch signal for the given axis is connected.

OT-: Used in parallel with TB1. If the TB1 OT- connection point has an external Limit Switch, it should be set to the OFF position. If there is no external Limit Switch, this dip switch can function as the Limit Switch; a dip switch set to ON indicates that the negative over travel Limit Switch signal for the given axis is connected.

MOD: A C-MODE control mode selection. Please refer to the Panasonic MINAS AC Servo Drive User Manual for the required settings for personal use. Set to OFF when left unused.

INH: Used in parallel with each drive connector J1, J2, J3, J4, J5, and J6. If the Servo-On signal is automatically output from the software, INH should be set to the OFF position when connected to the drive. Otherwise, INH can be set to the ON position to function as servo-on.

2.7 Emergency Stop Switch–S7

(1) Switch Definitions and Default Value Settings

(2) Explanation of Functions and Settings

The emergency stop switch is used in parallel with TB1. If the TB1 STOP connection point has an external STOP button, it should be set to the OFF position. If there is no external STOP button, this dip switch can function as the STOP button; the dip switch set to ON indicates that the STOP signal is connected, while the dip switch set to OFF indicates that the STOP signal is not connected.

2.8 Indicator Lights

(1) Indicator Light Definitions

Axis 1	Indicator Light	D2	D3	D4	D5	D29
	Definition	HOM1	OT1+	OT1-	SVON1	SRDY1
Axis 2	Indicator Light	D6	D7	D8	D9	D30
	Definition	HOM2	OT2+	OT2-	SVON 2	SRDY2
Axis 3	Indicator Light	D10	D11	D12	D13	D14
	Definition	HOM3	OT3+	OT3-	SVON 3	SRDY3
Axis 4	Indicator Light	D14	D15	D16	D17	D31
	Definition	HOM4	OT4+	OT4-	SVON 4	SRDY4
Axis 5	Indicator Light	D18	D19	D20	D21	D32
	Definition	HOM5	OT5+	OT5-	SVON 5	SRDY5
Axis 6	Indicator Light	D22	D23	D24	D25	D34
	Definition	HOM6	OT6+	OT6-	SVON 6	SRDY6
Other	Indicator Light	D26	D27	D28		
	Definition	+24 V	PRDY	ESTP		

(2) Explanation of Definitions:

HOM: This light indicates that the Home Switch for the given axis is activated.

OT+: This light indicates that the positive over-travel Limit Switch for the given axis is activated.

OT-: This light indicates that the negative over travel Limit Switch for the given axis is activated.

SVON: This light indicates that the servo-on signal has been transmitted from the motion control card.

+24V: This light indicates that the external +24 V is normal.

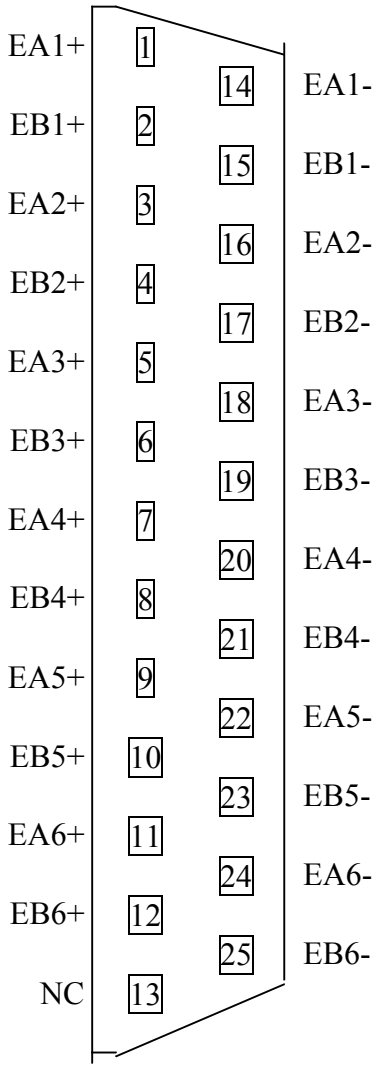
ESTP: This light indicates that the emergency stop signal has been input.

PRDY: This light indicates that the Position Ready signal has been transmitted from the motion control card. At this time, RDY+ and RDY- on TB1 are connected.

SRDY: This signal is transmitted from the drive. The light indicates that the Servo Ready signal has been input, meaning that the drive is in a Ready state.

2.9 DB1

(1) Pin Definitions



(2) Explanation of Functions

The encoder signal outputs for the six axes can externally connect to a counter or an oscilloscope to confirm that the encoder signal is normal.

2.10 Velocity or Torque Command Jumper Block (JP1, JP2, JP3, JP4, JP5, JP6)

(1) Pin Definitions

1	Velocity Command (V_CMD)
2	DAC Output
3	Torque Command (T_CMD)

(2) Function and Settings

Jumper	JP1	JP2	JP3	JP4	JP5	JP6
1, 2 Short Circuit	V_CMD 1	V_CMD 2	V_CMD 3	V_CMD 4	V_CMD 5	V_CMD 6
2, 3 Short Circuit	T_CMD1	T_CMD2	T_CMD3	T_CMD4	T_CMD5	T_CMD6

* The jumper listed above is ineffective if the pulse mode is set by the motor drive.