IMP-WB-1
Hardware User Manual

Rev.: V.1.1.0

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http://www.epcio.com.tw

Table of Contents

Chapter 1 Overview

1.1 Introduction

IMP-WB-1 is an 8-axis universal adapter developed by the MSL of ITRI for the signal adapting purpose for the IMP-2 (Intelligent motion control platform) and the servo motor (or stepper motor) drives. The user can connect it to drives from other manufacturers by using suitable wiring.

1.2 System Connection Diagram

The system connection diagram for the connection between the IMP-WB-1 and the IMP-2 is shown in Fig. 1-1. The IMP-WB-1 is connected with the IMP-2 through the SCSI II 100-Pin cables and the SCSI II 68-Pin cable. In addition, the IMP-WB-1 can be connected to various drives (up to 8 axes) to send the motion command from the IMP-2 via the wiring terminal block.

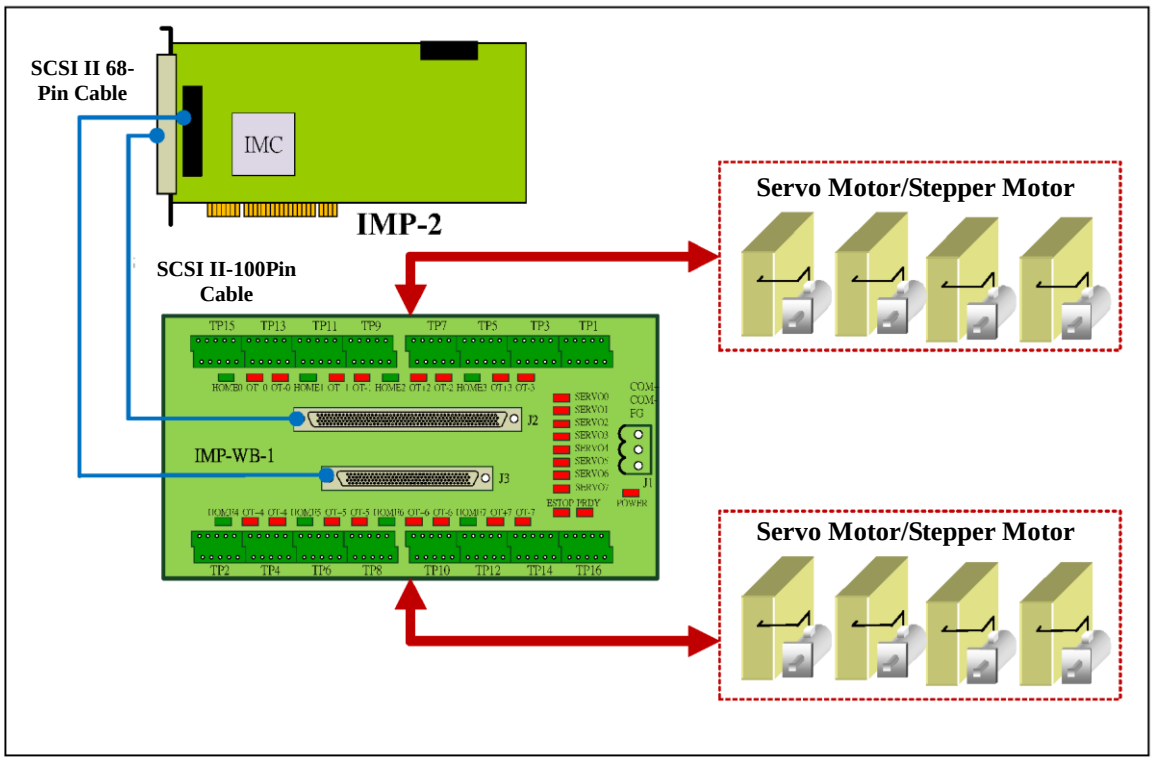

Fig. 1-1 System connection diagram

Chapter 2 Hardware Installation and Operation

2.1 Basic Installation Procedure of the System

A. Before carrying out the basic installation of the system, please carefully read the user manual.

B. The IMP-WB-1 must be used with the IMP-2 (please make sure that the IMP-2 has been installed completely).

C. Before execute the wiring operation, please remove/unplug the power.

D. Refer to the pin definitions of the terminal block (TP1~TP16, refer to the diagram in section **2.3.4** for more details) for the wiring with the drives.

E. Connect the IMP-WB-1 with the IMP-2. Connect the J2 and J3 of the IMP-WB-1 to the J2 and J3 of the IMP-2, respectively through the SCSI II 100-pin cable and SCSI II 68-pin cable.

F. Connect the external power of the IMP-WB-1 to +24VDC. (Please check the mode settings of the local I/O of the IMP-2 and refer to section **2.3.1** for details).

G. Perform tests on the IMP-2 to make sure if the operation is normal as expected. The user can also judge by inspecting the indicators (for the configuration of the indicators, please refer to section **2.4**).

2.2 Hardware Panel Configuration

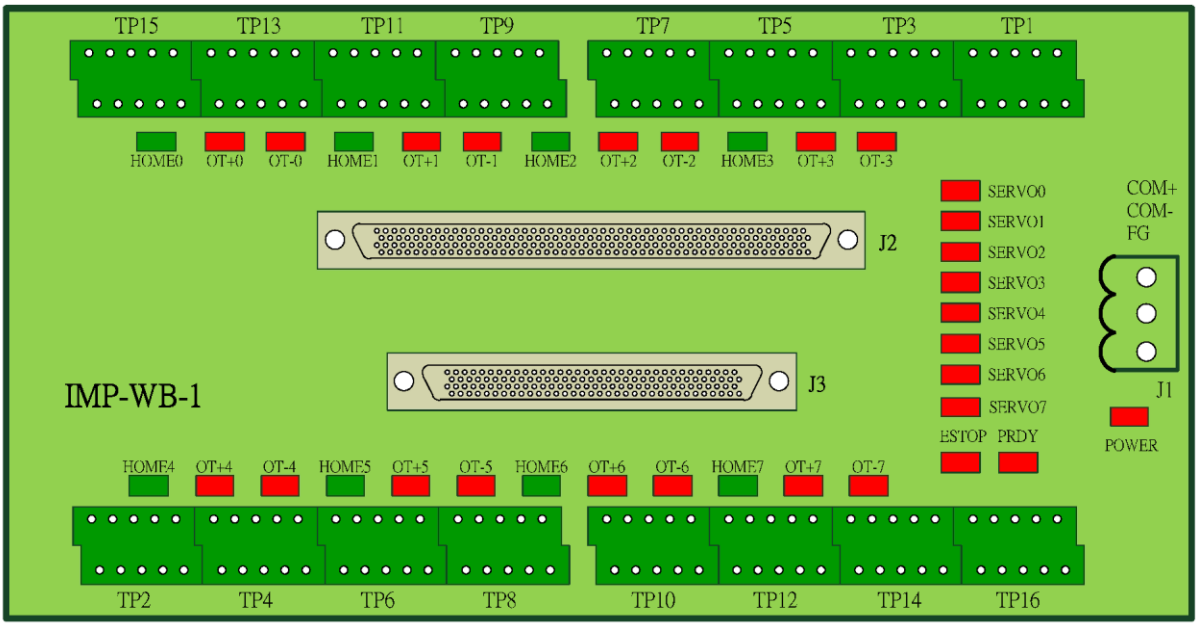

Fig. 2-1 Hardware panel configuration

Component	Name	Function
J1	3-Pin Terminal Female Socket	External connection +24VDC power, please refer to section 2.3.1
J2	SCSI II 100-Pin Connector	Connect to J2 of the IMP-2 through the cable, please refer to section 2.3.2
J3	SCSI II 68-Pin Connector	Connect to J3 of the IMP-2 through the cable, please refer to section 2.3.3
TP1~TP16	Wiring Terminal Block	Connect to drives from various manufacturers through wiring, please refer to section 2.3.4

2.3 Pin Assignments of Panel Connectors

2.3.1 Pin assignment of Terminal Female Socket (J1)

The following description is for the connection of the IMP-WB-1 to +24VDC power. The COM+ and COM- are connected to the positive and negative terminals of the power input, respectively.

Pin	Name	Reference Point	Description
1	COM+	COM-	Positive terminal for external 24V power input
2	COM-	--	Negative terminal for external 24V power input
3	FG		Field Ground

2.3.2 Pin Definitions and Function of SCSI II-100Pin (J2) Connector

The connectors (J2 and J3) of the IMP-WB-1 are connected to the IMP-2 through the SCSI II 100-Pin cables and SCSI II 68-Pin cables, respectively. Please refer to the system connection diagram (Fig. 1-1) for the connection details.

For the pin assignment and function of the SCSI II 100-Pin connector, please refer to the following table:

SCSI II 100-Pin Connector			
Name	**Pin**	**Pin**	**Name**
AGND	1	51	AGND
DAC0	2	52	DAC3
DAC1	3	53	DAC4
DAC2	4	54	DAC5
+5V	5	55	COM-
COM+	6	56	COM-
COM	7	57	ESTOP
COM	8	58	PRDY
HOM0	9	59	HOM1
OT0+	10	60	OT1+
OT0-	11	61	OT1-
SVON0	12	62	SVON1
HOM2	13	63	HOM3
OT2+	14	64	OT3+
OT2-	15	65	OT3-
SVON2	16	66	SVON3
HOM4	17	67	HOM5
OT4+	18	68	OT5+
OT4-	19	69	OT5-
SVON4	20	70	SVON5
EA0+	21	71	EA1+
EA0-	22	72	EA1-
EB0+	23	73	EB1+
EB0-	24	74	EB1-
EC0+	25	75	EC1+
EC0-	26	76	EC1-
EA2+	27	77	EA3+
EA2-	28	78	EA3-
EB2+	29	79	EB3+
EB2-	30	80	EB3-
EC2+	31	81	EC3+
EC2-	32	82	EC3-
EA4+	33	83	EA5+
EA4-	34	84	EA5-
EB4+	35	85	EB5+
EB4-	36	86	EB5-
EC4+	37	87	EC5+
EC4-	38	88	EC5-
PA0+	39	89	PA1+
PA0-	40	90	PA1-
PB0+	41	91	PB1+
PB0-	42	92	PB1-
PA2+	43	93	PA3+
PA2-	44	94	PA3-
PB2+	45	95	PB3+
PB2-	46	96	PB3-
PA4+	47	97	PA5+
PA4-	48	98	PA5-
PB4+	49	99	PB5+
PB4-	50	100	PB5-

Pin	Assignment	Reference	Function
1	AGND	--	DAC output reference terminal
2	DAC0	AGND	Group 0 analog output contact
3	DAC1	AGND	Group 1 analog output contact
4	DAC2	AGND	Group 2 analog output contact
5	+5V	GND	+5V output
6	COM+	COM-	The positive terminal of the 24 V electrical supply input
7	COM	--	LIO input reference terminal
8	COM	--	LIO input reference terminal
9	HOM0	COM-	Group 0 home sensor input
10	OT0+	COM-	Group 0 positive over-travel sensor input
11	OT0-	COM-	Group 0 negative over-travel sensor input
12	SVON0	COM-	Group 0 servo-on output
13	HOM2	COM-	Group 2 home sensor input
14	OT2+	COM-	Group 2 positive over-travel sensor input
15	OT2-	COM-	Group 2 negative over-travel sensor input
16	SVON2	COM-	Group 2 servo-on output
17	HOM4	COM-	Group 4 home sensor input
18	OT4+	COM-	Group 4 positive over-travel sensor input
19	OT4-	COM-	Group 4 negative over-travel sensor input
20	SVON4	COM-	Group 4 servo-on output
21	EA0+	--	Group 0 encoder input. Positive terminal of A phase differential signals
22	EA0-	--	Group 0 encoder input. Negative terminal of A phase differential signals
23	EB0+	--	Group 0 encoder input. Positive terminal of B phase differential signals
24	EB0-	--	Group 0 encoder input. Negative terminal of B phase differential signals
25	EC0+	--	Group 0 encoder input. Positive terminal of Z phase differential signals
26	EC0-	--	Group 0 encoder input. Negative terminal of Z phase differential signals
27	EA2+	--	Group 2 encoder input. Positive terminal of A phase differential signals
28	EA2-	--	Group 2 encoder input. Negative terminal of A phase differential signals
29	EB2+	--	Group 2 encoder input. Positive terminal of B phase differential signals
30	EB2-	--	Group 2 encoder input. Negative terminal of B phase differential signals
31	EC2+	--	Group 2 encoder input. Positive terminal of Z phase differential signals
32	EC2-	--	Group 2 encoder input. Negative terminal of Z phase differential signals
33	EA4+	--	Group 4 encoder input. Positive terminal of A phase differential signals
34	EA4-	--	Group 4 encoder input. Negative terminal of A phase differential signals
35	EB4+	--	Group 4 encoder input. Positive terminal of B phase differential signals
36	EB4-	--	Group 4 encoder input. Negative terminal of B phase differential signals
37	EC4+	--	Group 4 encoder input. Positive terminal of Z phase differential signals
38	EC4-	--	Group 4 encoder input. Negative terminal of Z phase differential signals
39	PA0+	--	Group 0 pulse output. Positive terminal of A phase differential signals
40	PA0-	--	Group 0 pulse output. Negative terminal of A

			phase differential signals
41	PB0+	--	Group 0 pulse output. Positive terminal of B phase differential signals
42	PB0-	--	Group 0 pulse output. Negative terminal of B phase differential signals
43	PA2+	--	Group 2 pulse output. Positive terminal of A phase differential signals
44	PA2-	--	Group 2 pulse output. Negative terminal of A phase differential signals
45	PB2+	--	Group 2 pulse output. Positive terminal of B phase differential signals
46	PB2-	--	Group 2 pulse output. Negative terminal of B phase differential signals
47	PA4+	--	Group 4 pulse output. Positive terminal of A phase differential signals
48	PA4-	--	Group 4 pulse output. Negative terminal of A phase differential signals
49	PB4+	--	Group 4 pulse output. Positive terminal of B phase differential signals
50	PB4-	--	Group 4 pulse output. Negative terminal of B phase differential signals
51	AGND	--	Pulse and DAC output reference terminal
52	DAC3	AGND	Group 3 analog output contact
53	DAC4	AGND	Group 4 analog output contact
54	DAC5	AGND	Group 5 analog output contact
55	COM-	--	The negative terminal of the 24 V electrical supply input
56	COM-	--	The negative terminal of the 24 V electrical supply input
57	ESTOP	COM-	Emergency stop input contact
58	PRDY	COM-	Position Ready output contact
59	HOM1	COM-	Group 1 home sensor input
60	OT1+	COM-	Group 1 positive over-travel limit sensor input
61	OT1-	COM-	Group 1 negative over-travel limit sensor input
62	SVON1	COM-	Group 1 servo-on output
63	HOM3	COM-	Group 3 home sensor input
64	OT3+	COM-	Group 3 positive over-travel limit sensor input
65	OT3-	COM-	Group 3 negative over-travel limit sensor input
66	SVON3	COM-	Group 3 servo-on output
67	HOM5	COM-	Group 5 home sensor input
68	OT5+	COM-	Group 5 positive over-travel limit sensor input
69	OT5-	COM-	Group 5 negative over-travel limit sensor input
70	SVON5	COM-	Group 5 servo-on output
71	EA1+	--	Group 1 encoder input. Positive terminal of A phase differential signals
72	EA1-	--	Group 1 encoder input. Negative terminal of A phase differential signals
73	EB1+	--	Group 1 encoder input. Positive terminal of B phase differential signals
74	EB1-	--	Group 1 encoder input. Negative terminal of B phase differential signals
75	EC1+	--	Group 1 encoder input. Positive terminal of Z phase differential signals
76	EC1-	--	Group 1 encoder input. Negative terminal of Z phase differential signals
77	EA3+	--	Group 3 encoder input. Positive terminal of A phase differential signals
78	EA3-	--	Group 3 encoder input. Negative terminal of A phase differential signals
79	EB3+	--	Group 3 encoder input. Positive terminal of B phase differential signals
80	EB3-	--	Group 3 encoder input. Negative terminal of B

			phase differential signals
81	EC3+	--	Group 3 encoder input. Positive terminal of Z phase differential signals
82	EC3-	--	Group 3 encoder input. Negative terminal of Z phase differential signals
83	EA5+	--	Group 5 encoder input. Positive terminal of A phase differential signals
84	EA5-	--	Group 5 encoder input. Negative terminal of A phase differential signals
85	EB5+	--	Group 5 encoder input. Positive terminal of B phase differential signals
86	EB5-	--	Group 5 encoder input. Negative terminal of B phase differential signals
87	EC5+	--	Group 5 encoder input. Positive terminal of Z phase differential signals
88	EC5-	--	Group 5 encoder input. Negative terminal of Z phase differential signals
89	PA1+	--	Group 1 pulse output. Positive terminal of A phase differential signals
90	PA1-	--	Group 1 pulse output. Negative terminal of A phase differential signals
91	PB1+	--	Group 1 pulse output. Positive terminal of B phase differential signals
92	PB1-	--	Group 1 pulse output. Negative terminal of B phase differential signals
93	PA3+	--	Group 3 pulse output. Positive terminal of A phase differential signals
94	PA3-	--	Group 3 pulse output. Negative terminal of A phase differential signals
95	PB3+	--	Group 3 pulse output. Positive terminal of B phase differential signals
96	PB3-	--	Group 3 pulse output. Negative terminal of B phase differential signals
97	PA5+	--	Group 5 pulse output. Positive terminal of A phase differential signals
98	PA5-	--	Group 5 pulse output. Negative terminal of A phase differential signals
99	PB5+	--	Group 5 pulse output. Positive terminal of B phase differential signals
100	PB5-	--	Group 5 pulse output. Negative terminal of B phase differential signals

2.3.3 Pin Assignment and Function of SCSI II 68-Pin (J3) Connector

For the pin assignment and function of each pin in the SCSI II 68-Pin connector, please refer to the following table:

SCSI II 68-Pin Connector			
Name	**Pin**	**Pin**	**Name**
AGND	1	35	NC
AGND	2	36	NC
DAC6	3	37	NC
DAC7	4	38	NC
HOM6	5	39	GND
HOM7	6	40	GND
OT6+	7	41	NC
OT7+	8	42	NC
OT6-	9	43	NC
OT7-	10	44	NC
SVON6	11	45	NC
SVON7	12	46	NC
EA6+	13	47	NC
EA7+	14	48	NC
EA6-	15	49	NC
EA7-	16	50	NC
EB6+	17	51	NC
EB7+	18	52	NC
EB6-	19	53	NC
EB7-	20	54	NC
EC6+	21	55	NC
EC7+	22	56	NC
EC6-	23	57	NC
EC7-	24	58	NC
PA6+	25	59	NC
PA7+	26	60	NC
PA6-	27	61	NC
PA7-	28	62	NC
PB6+	29	63	NC
PB7+	30	64	NC
PB6-	31	65	NC
PB7-	32	66	NC
NC	33	67	NC
NC	34	68	NC

Pin	**Name**	Reference	Description of Function
1	AGND	--	DAC output reference terminal
2	AGND	--	DAC output reference terminal
3	DAC6	AGND	Group 6 analog output contact
4	DAC7	AGND	Group 7 analog output contact
5	HOM6	COM-	Group 6 home sensor input
6	HOM7	COM-	Group 7 home sensor input
7	OT6+	COM-	Group 6 positive over-travel limit sensor input
8	OT7+	COM-	Group 7 positive over-travel limit sensor input
9	OT6-	COM-	Group 6 negative over-travel limit sensor input
10	OT7-	COM-	Group 7 negative over-travel limit sensor input
11	SVON6	COM-	Group 6 servo-on output
12	SVON7	COM-	Group 7 servo-on output
13	EA6+	--	Group 6 encoder input. Positive terminal of A phase differential signals
14	EA7+	--	Group 7 encoder input. Positive terminal of A phase differential signals
15	EA6-	--	Group 6 encoder input. Negative terminal of A phase differential signals
16	EA7-	--	Group 7 encoder input. Negative terminal of A phase differential signals
17	EB6+	--	Group 6 encoder input. Positive terminal of B phase differential signals
18	EB7+	--	Group 7 encoder input. Positive terminal of B phase differential signals
19	EB6-	--	Group 6 encoder input. Negative terminal of B phase differential signals
20	EB7-	--	Group 7 encoder input. Negative terminal of B phase differential signals
21	EC6+	--	Group 6 encoder input. Positive terminal of Z phase differential signals
22	EC7+	--	Group 7 encoder input. Positive terminal of Z phase differential signals
23	EC6-	--	Group 6 encoder input. Negative terminal of Z phase differential signals
24	EC7-	--	Group 7 encoder input. Negative terminal of Z phase differential signals
25	PA6+	--	Group 6 pulse output. Positive terminal of A phase differential signals
26	PA7+	--	Group 7 pulse output. Positive terminal of A phase differential signals
27	PA6-	--	Group 6 pulse output. Negative terminal of A phase differential signals
28	PA7-	--	Group 7 pulse output. Negative terminal of A phase differential signals
29	PB6+	--	Group 6 pulse output. Positive terminal of B phase differential signals
30	PB7+	--	Group 7 pulse output. Positive terminal of B phase differential signals
31	PB6-	--	Group 6 pulse output. Negative terminal of B phase differential signals
32	PB7-	--	Group 7 pulse output. Negative terminal of B phase differential signals
33~68	NC		

2.3.4 Configuration and Pin Assignments of the Terminals on the Wiring Terminal Block (TP1~TP16)

The IMP-WB-1 connects to the drives from various manufacturers through the terminal block (TP1~TP16). The configuration and pin assignments of the terminal block are as follows:

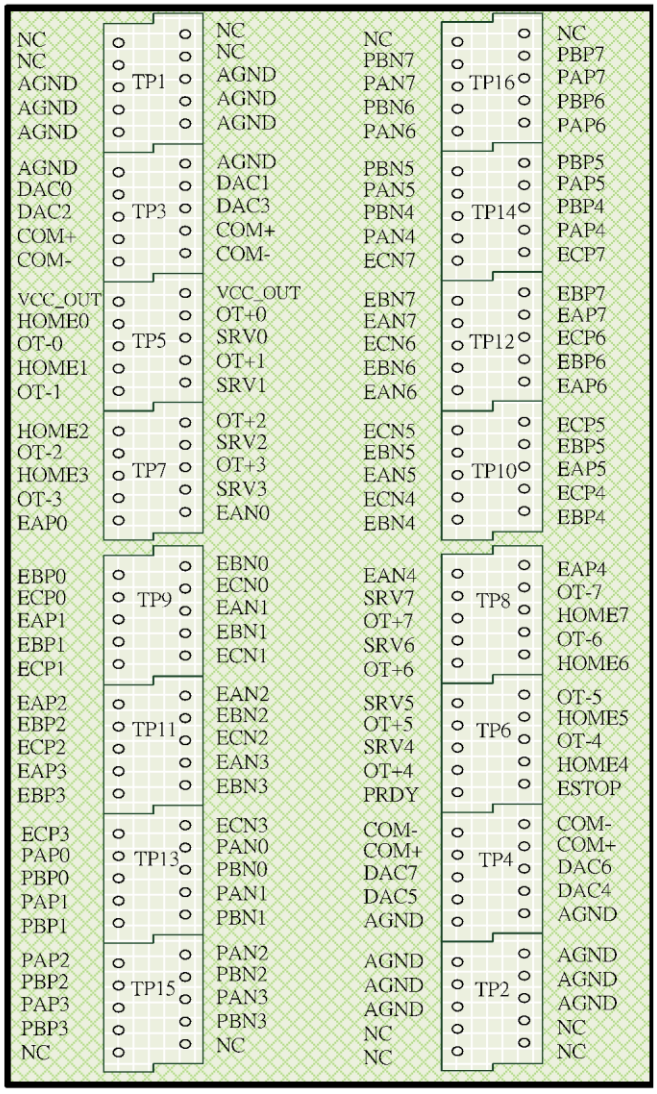

Fig. 2-2 Configuration of the terminals on the terminal block

Text Printed on the Board	SCSI II Pin Name	Text Printed on the Board	SCSI II Pin Name
EAPn (n=0~7)	EAn+ (n=0~7)	PAPn (n=0~7)	PAn+ (n=0~7)
EBPn (n=0~7)	EBn+ (n=0~7)	PBPn (n=0~7)	PBn+ (n=0~7)
ECPn (n=0~7)	ECn+ (n=0~7)	PANn (n=0~7)	PAn- (n=0~7)
EANn (n=0~7)	EAn- (n=0~7)	PBNn (n=0~7)	PBn- (n=0~7)
EBNn (n=0~7)	EBn- (n=0~7)	OT+n (n=0~7)	OTn+ (n=0~7)
ECNn (n=0~7)	ECn- (n=0~7)	OT-n (n=0~7)	OTn- (n=0~7)

2.4 Configuration of Indicators

The normal operation of local I/O of the IMP-2 can be determined according to the associated indicators on the IMP-WB-1. The configuration and description of the indicators are as follows:

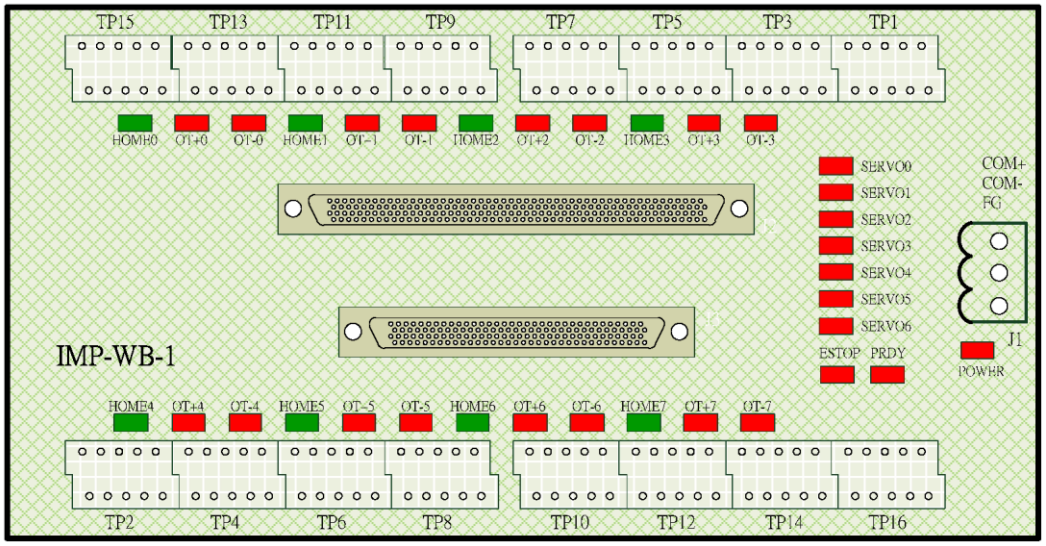

Fig. 2-3 Configuration of indicators

Text Printed on the Board	Indicator	Description of Operation
POWER	Red	This light indicates that the external +24 V is normal.
HOMEn (n=0~7)	Green	This light indicates that the home sensor for the first axis (HOME0) is activated (HOME1, HOME2, HOME3, HOME4, HOME5, HOME6, and HOME7 each indicate the home sensor statuses of their respective axes).
OT+n (n=0~7)	Red	This light indicates that the positive travel limit sensor for the first axis (OT0+) is activated (OT1+, OT2+, OT3+, OT4+, OT5+, OT6+ and OT7+ each indicate the positive travel limit sensor statuses of their respective axes).
OT-n (n=0~7)	Red	This light indicates that the negative travel limit sensor for the first axis (OT0-) is activated (OT1-, OT2-, OT3-, OT4-, OT5-, OT6- and OT7- each indicate the negative travel limit sensor statuses of their respective axes).
SERVOn (n=0~7)	Red	This light indicates that the servo-on signal for the first axis (SVON0) has already been output from the motion control card (SVON1, SVON2, SVON3, SVON4, SVON5, SVON6 and SVON7 each indicate the servo-on statuses of their respective axes).
PRDY	Red	This light indicates that the Position Ready signal has already been output from the motion control card.
ESTOP	Red	This light indicates an Emergency Stop signal input.

2.5 Mechanical Dimensions

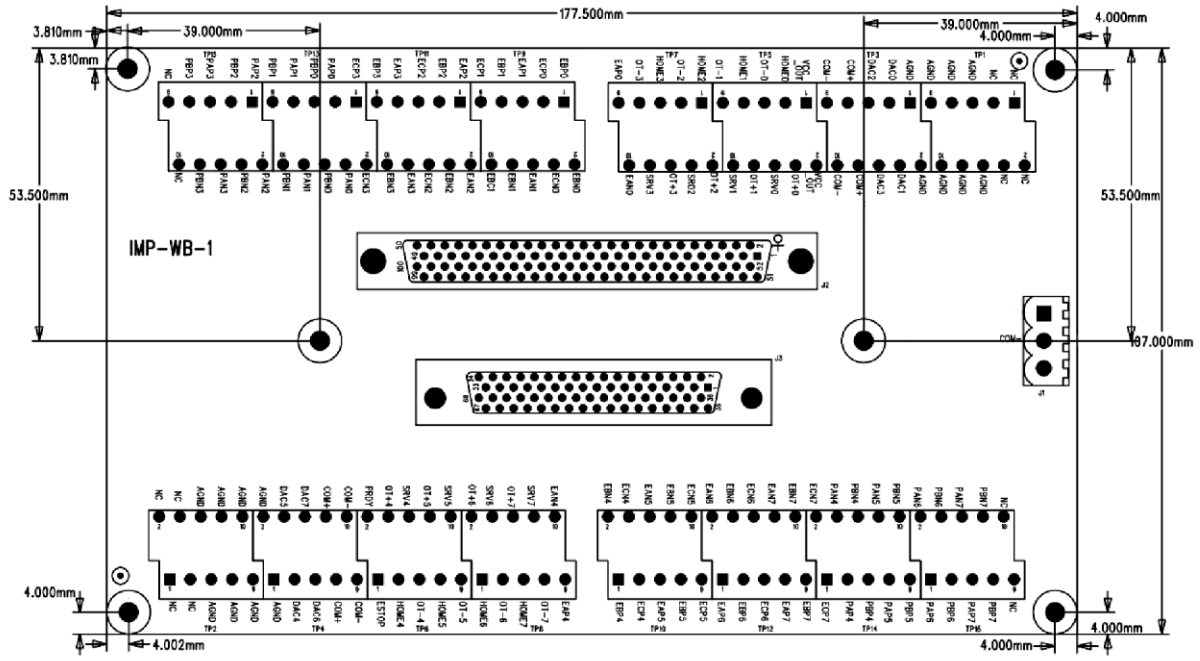

Fig. 2-4 Mechanical Dimensions

Note: The screw diameter is 3.57mm

Revision History

Date	Rev.	Contents of Revision
2010/10/04	V.1.0.1	Section 2.6: Pin assignments and description of each pins on the terminal block TP1~TP16 were added
2012/12/04	V.1.0.2	The contents were revised and the drawings were modified
2013/7/15	V.1.1.0	Section 2.5: Mechanical dimensions was added and the contents were revised