Universal Board User's manual

of PWB Corporation

for CloudTesting™ Station

Supplied by Cloud Testing Service, Inc.

Revision 0.3

PWB Corporation

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1. Preface

This document explains about the procedure to build and connect signals to DUT on universal board. All the information is written in this document. Together with universal board, cable junction board information is included.

2. About universal board for CloudTesting™ Station

Universal boards specified in this document offer you a quick launch of your device testing setup with CloudTesting™ Station. Connectors for CloudTesting™ Station are preinstalled. Universal area offers you the space of DUT and designated circuits for device testing.
By connecting signals and powers for the device in this universal area, you can start device testing with CloudTesting™ station.

3. Advantages of PWB universal boards

Universal board supplied by PWB Corporation (herein after PWB) have following advantages for easy preparation and good performance.

3-1. High flexibility to CloudTesting™ Station

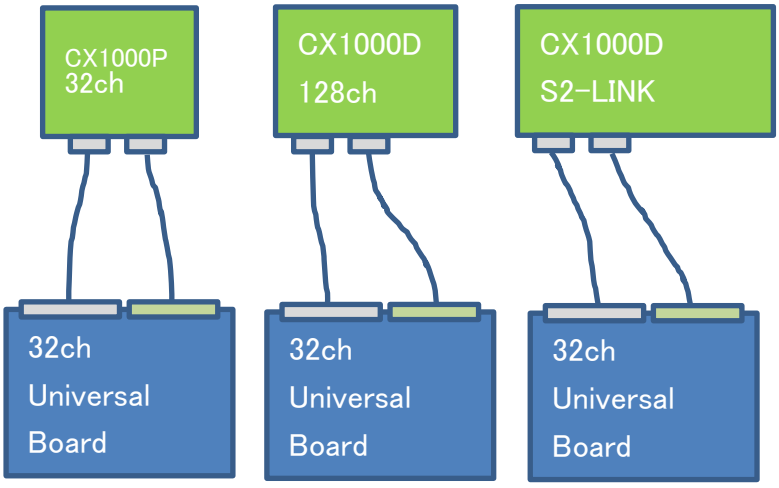
Each FUNC Connectors are same connections on this universal board. And Each CONT connectors are also same connections. This connection on board enable you quite flexible matching with CX1000.

Confirm required spaces for DUT and designated circuits, and select suitable universal board in our products. The universal board is available for testing up to system resources.

Case1) 32ch board is used with CX1000P. 128ch universal board is used with CX1000D and 256ch universal board is used with CX1000D S2-LINK.

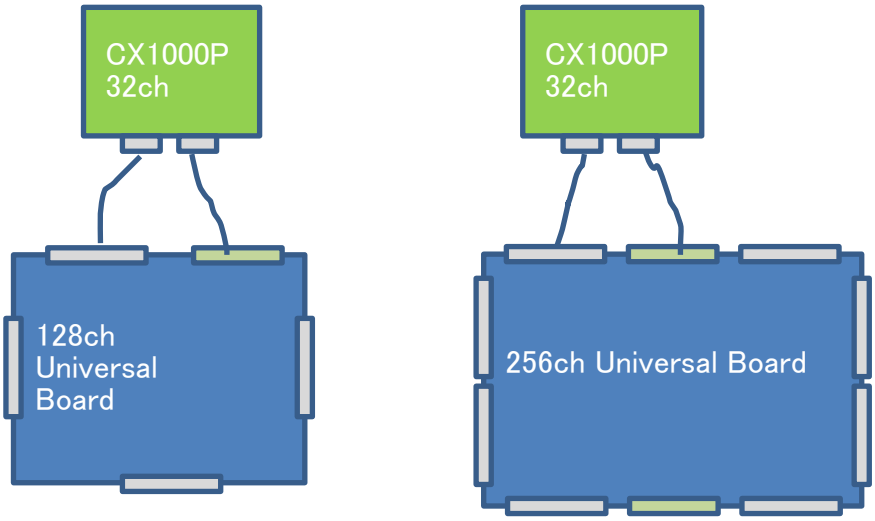
Case2) 32ch universal board is driven by all CX1000 systems when the circuit on board is small enough for 32ch universal board.

Fig. 1 Small universal board meets to larger CX1000



Case 3) For larger circuit (i.e. larger area) is required for device testing, larger universal board such as 128ch or 256ch universal board is available for smaller system, such as CX1000P.

Fig. 2 Large universal board meets to smaller CX1000



3-2. Wide universal area

For easy wiring on universal board, relay circuits and power supply patterns are placed closed to universal area and wide universal area is kept on the universal board.
IO channel location is met with device. Incremental number of IO channel is counter clock wise as the numbering of device pin is CCW.
Three variety of universal board will support all devices tested on CX1000, with number of IO channels and variety of universal area.

3-3. Flexible relay selection and quick connection of prewired Relay

Two types of relays are prewired on universal board. One is conventional mechanical relay (OMRON: G6K-2P-3V) for low contact resistance, and PhotoMOS relay (TOSHIBA: TLP3203) for low drive current.
Power supply and control signal of relays are preprinted on universal board. You can start operate just assembling these relay and connect signals. For PhotoMOS relay circuits, coaxial press fit cable enables one touch connection to relays.

3-4. Smooth docking with other verification system

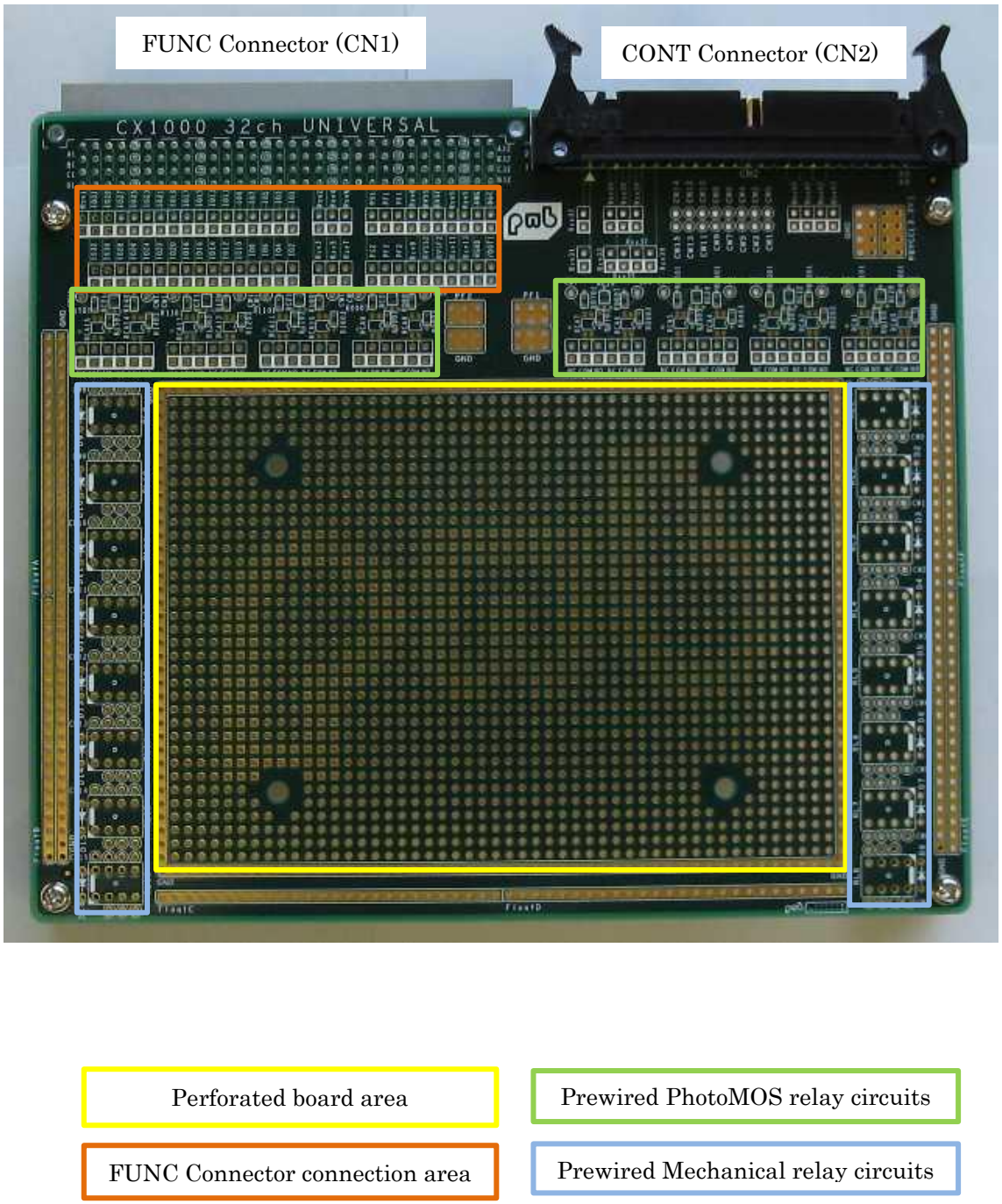
In case of verification system docking, the working distance is limited in many systems such as Emission Microscope, optical micro scopes and so on.
As the cable is connected to this universal board from horizontal direction, the height of the setup including universal board can be minimized.
Spaces for cables when it is connected in vertical direction, is not necessary to shorten the height of test setup.

4. Universal Board

4-1. Circuits on universal board

Fig. 3 shows 32 ch universal board. Hereinafter, preparation such as DUT mounting, wiring between DUT and CX1000 connectors, for DUT testing on universal board by using this board .
For 128ch, please refer to Fig. 17, and for 256ch refer to Fig. 18, respectively.

Fig. 3　32ch universal Board



4-2. DUT area on Universal board

Please mount DUT and required circuits (such as bypass Caps, terminators, switching load by relay) on perforated board area. This perforated board area adopt 0.1 in grid system accommodates integrated circuits in DIP packages and many other types of through-hole components.
When you need wider area for these circuits, you can select larger universal board from PWB. The other way to realize is stacking additional perforated board on this universal board by using Pillars at 4 holes. The perforated area is surrounded by GND.

4-3. Power and signals connection

4-3-1. Device power supply

Device power supply circuitry

Device powers are supplied in FUNC connector from CX1000. Two device powers are available in a FUNC connector. These power supplies (Force lines) are assigned as PF1 or PF2 on universal board. Connect thick power cable from these points to device power pins. Together with Force lines, power voltage sense lines also must be connected from device power pins to PS1 or PS2 respectively. PS1, PS2 are located close to FUNC connector. Blue colored lines in should be connected.

Fig. 4 Device power supply connection

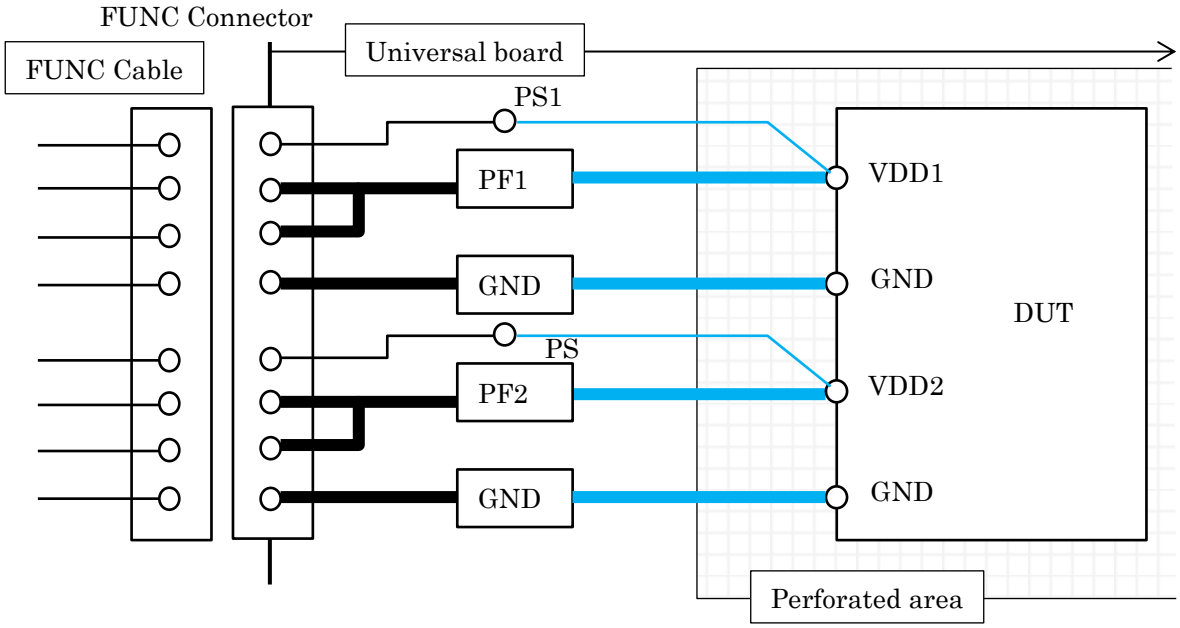
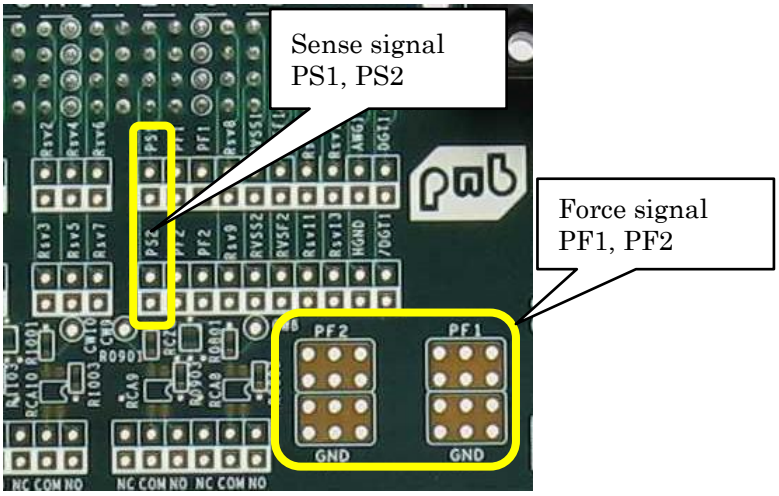


Fig. 5 Power sense and force position



Available device power names on universal boards

Table 1 Device power supplies on board

Universal board			Mark on board	FUNC Connector pin	
32ch	128ch	256ch	PF1	CN1.A24	CN1.A25
			PF2	CN1.C24	CN1.C25
			PF3	CN2.A24	CN2.A25
			PF4	CN2.C24	CN2.C25
			PF5	CN3.A24	CN3.A25
			PF6	CN3.C24	CN3.C25
			PF7	CN4.A24	CN4.A25
			PF8	CN4.C24	CN4.C25
			PF9	CN5.A24	CN5.A25
			PF10	CN5.C24	CN5.C25
			PF11	CN6.A24	CN6.A25
			PF12	CN6.C24	CN6.C25
			PF13	CN7.A24	CN7.A25
			PF14	CN7.C24	CN7.C25
			PF15	CN8.A24	CN8.A25
			PF16	CN8.C24	CN8.C25

Example; PF1 is connected to A24 pin and A25 pin in FUNC connector CN1.

PF number is marked sequentially on universal board.

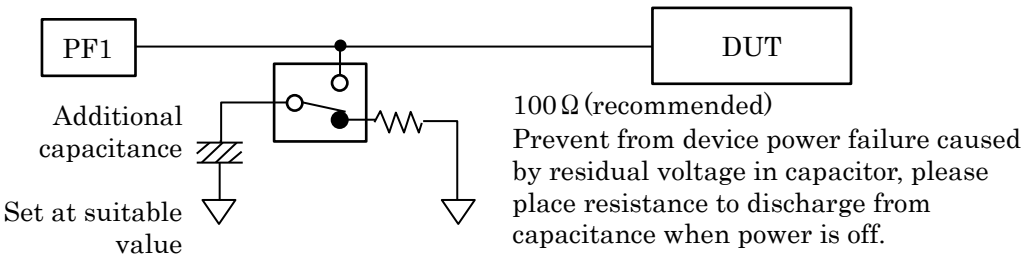
Marks of power supply land are listed in Table 1, when hook up FUNC connector to universal boards. When you use 32ch CX1000 system with 256ch universal board, you can use hook up any FUNC connector, CN1-CN8. In case that 128ch is used with 256ch universal board, you can use any FUNC connectors. So you can select suitable power supply land position on the board for device.

Power supply bypass capacitor circuit

Power supply bypass capacitor function (22uF) is built in CX1000.

Higher capacitance is required to stabilize power supply voltage regulation, and power supply current measurement is required, following circuit shown in Fig. 6. Mechanical relay, i.e. G6K-2P (3V), OMRON is recommended to use for low contact resistance. For this relay control, please use one Control Word, which is located at relay area.

Fig. 6 Bypass capacitor circuit



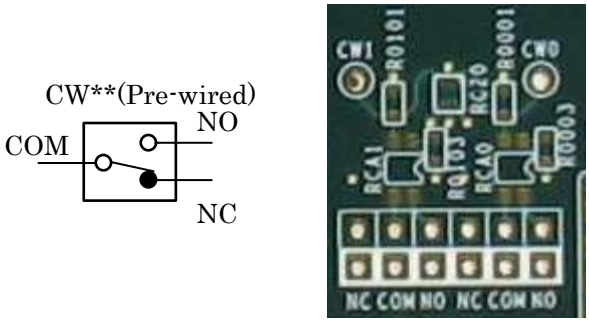
4-3-2. Relay circuit

Relay power supply and relay control signal are supplied through CONT cable.

PhotoMOS relay circuit

Advantage of PhotoMOS relay circuit is low drive current. Drive current is designed at about 5mA. As maximum relay power supply current is 500mA, it is enough supply current even if 16 PhotoMOS relays are driven simultaneously.
PhotoMOS relay TLP3203 from Toshiba is designed to be used. PhotoMOS relay circuit has one transfer circuit controlled by CW(Control Word) control. Connect signal form customer designed board to COM (Common), NC (Normally Close) and NO (Normally Open) and set CX1000 to control corresponding CW to the relay as CW signal on universal board have pre-wired.
CW No is marked adjacent to the relay circuit. This CW signal is connected both PhotoMOS relay and mechanical relay.
Through hole of COM, NC and NO have paired GND. GND through holes are surrounded by white square line.

Fig. 7 PhotoMOS relay circuit and board layout



Mounting Photo MOS relay circuit

Though PhotoMOS relay circuits are patterned on universal board, the parts are not included and not mounted. Please purchase PhotoMOS relay set from PWB to install. Required parts for 10 PhotoMOS relay circuits are included. Mount the parts to the board following parts mark in Table 2.

BOM for PhotoMOS relay circuits

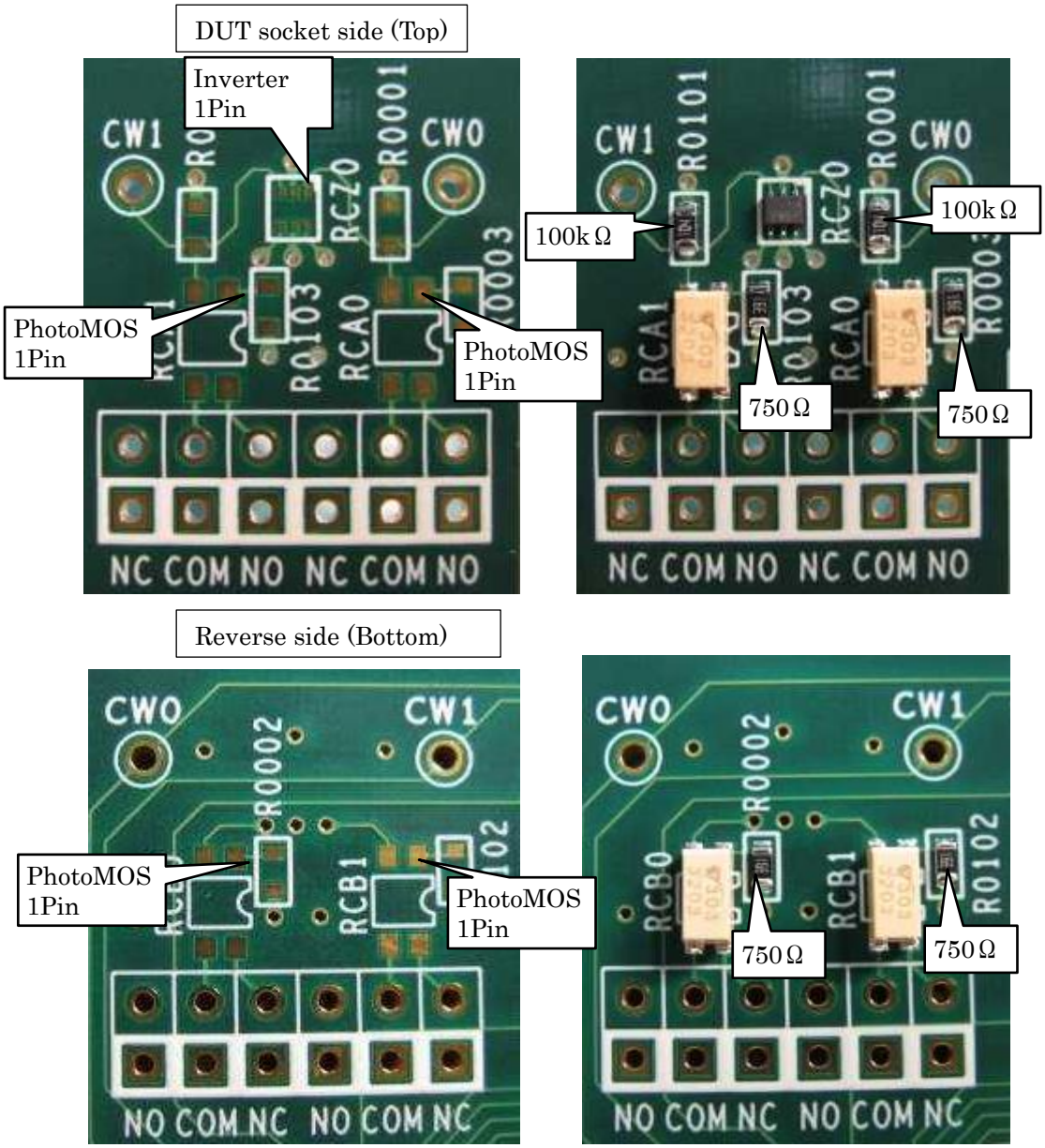
Table 2 shows the BOM for CW0 and CW1. For other CW, replace bold number in this list to suitable CW number. As one inverter is used for both CW0 and CW1, even number of parts mark is used.

Table 2 Bill of Materials for PhotoMOS relay circuit

Mount face	Parts mark	Parts name	Parts code resistance	Manufacture	Remarks
Top	RCA**0**	PhotoMOS Relay	TLP3203	Toshiba	Note: Pin1
	RCA**1**	PhotoMOS Relay	TLP3203	Toshiba	Note: Pin1
	RCZ**0**	Inverter	TC7PH04FE	Toshiba	Note: Pin1
	R0**0**01	Resister	100kΩ		Size:1608(Metric)
	R01**0**1	Resister	100kΩ		Size:16)08(Metric)
	R00**0**3	Resister	750Ω		Size:1608(Metric)
	R01**0**3	Resister	750Ω		Size:1608(Metric)
Bottom	RCB**0**	PhotoMOS Relay	TLP3203	Toshiba	Note: Pin1
	RCB**1**	PhotoMOS Relay	TLP3203	Toshiba	Note: Pin1
	R00**0**2	Resister	750Ω		Size:1608(Metric)
	R01**0**2	Resister	750Ω		Size:1608(Metric)

Parts mounting location for PhotoMOS relay circuit

Fig. 8 Parts mounting location

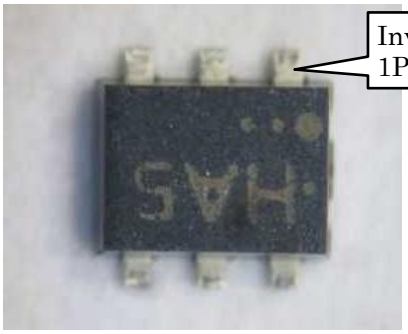


Remarks:
Please pay attention not to mismatch Pin1 position between device and board or PhotoMOS and inverter.

Specification of PhotoMOS TLP3203

On-State Resistance: 0.22 Ω (max), 0.18 Ω (typ.)
Output Capacitance: 40 pF (typ.)
On-State Current: 0.9 A (max)
4-pin SSOP (SSOP4): 1.8-mm high, 1.27-mm pitch

Fig. 9 Detail of Inverter and Pin1



Inverter (TC7PH04FE)

Fig. 10 Detail of PhotoMOS and Pi1

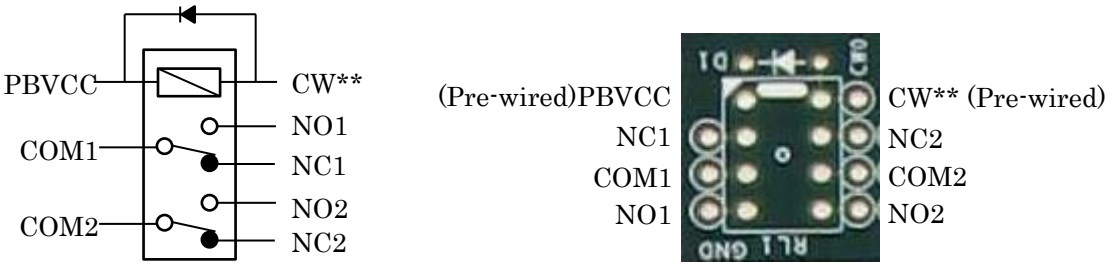
PhotoMOS Relay (TLP3203)

As the soldering pad is very small, please soldering under magnifying glass to confirm.

Mounting of mechanical relay

Advantage of mechanical relay is simple in circuit. For mechanical relay circuit, G6K-2P (3V) form OMRON is designed to be used. Please purchase Mechanical relay set from PWB to install. Required parts for 20 relays and diodes are included. It is recommended to mount relay socket or pin socket, for easy relay replacement.

Fig. 11 Mechanical relay circuit and board layout



For mechanical relay signals, paired GND to relay pins do not exist.

In case of mechanical relay, reverse voltage is induced on relay control pin when relay current have cut. In order to prevent from damage to the system, insert diode to absorb induced voltage. This diode is also pre-designed and wired in board. Please use this diode together with mechanical relay. This diode is included in mechanical relay set from PWB.

Relay control (Control Word) marks

Table 3 shows the list of control word and its connection. These control words are pre-wired in board in all universal boards. When you need to use these control words on perforated area, you can use suitable CW number on relay area.
Table 3 shows the control word mark and corresponding connector.

Table 3 Relay control (Control Word) marks on universal boards and corresponding connector

Control Word mark	CONT Connector		
	32ch Universal	128ch Universal	256ch Universal
CW0	CN2.27	CN5.27	CN9.27
CW1	CN2.28	CN5.28	CN9.28
CW2	CN2.25	CN5.25	CN9.25
CW3	CN2.26	CN5.26	CN9.26
CW4	CN2.23	CN5.23	CN9.23
CW5	CN2.24	CN5.24	CN9.24
CW6	CN2.21	CN5.21	CN9.21
CW7	CN2.22	CN5.22	CN9.22
CW8	CN2.19	CN5.19	CN9.19
CW9	CN2.20	CN5.20	CN9.20
CW10	CN2.17	CN5.17	CN9.17
CW11	CN2.18	CN5.18	CN9.18
CW12	CN2.15	CN5.15	CN9.15
CW13	CN2.16	CN5.16	CN9.16
CW14	CN2.13	CN5.13	CN9.13
CW15	CN2.14	CN5.14	CN9.14
CW16			CN10.27
CW17			CN10.28
CW18			CN10.25
CW19			CN10.26
CW20			CN10.23
CW21			CN10.24
CW22			CN10.21
CW23			CN10.22
CW24			CN10.19
CW25			CN10.20
CW26			CN10.17
CW27			CN10.18
CW28			CN10.15
CW29			CN10.16
CW30			CN10.13
CW31			CN10.14

On 256ch universal board, 32 relay circuits are available when CN9 and CN10 are connected from CX1000.
From 32ch or 128ch system to 256ch universal board, 16 relay circuits are available by connecting to CN9 or CN10, whichever.

4-3-3. I/O signals

I/O signal and analog signals are supplied through FUNC connector. And all signals are connected to though holes in FUNC connection area and marked as listed in Table 4 and Table 5.

I/O signal connection

I/O signals are available at FUNC signal connection area as shown in Fig. 3. When you use coaxial cable set (25cm or 50cm), signal is extracted from through hole just inserting the coaxial cable into through holes.

Analog signal connection

Analog signals are also connected to through holes in FUNC signal connection area. Please use these through holes to connect signal to DUT.

Table 4 FUNC connector signal and signal mark on board (32ch)

FUNC Connector			32ch CN1	
	A	C	A	C
1	Reserve	NC	Rsv1	Open
2	I/O 31	I/O 32	IO31	IO32
3	I/O 29	I/O 30	IO29	IO30
4	I/O 27	I/O 28	IO27	IO28
5	I/O 25	I/O 26	IO25	IO26
6	I/O 23	I/O 24	IO23	IO24
7	I/O 21	I/O 22	IO21	IO22
8	I/O 19	I/O 20	IO19	IO20
9	I/O 17	I/O 18	IO17	IO18
10	I/O 15	I/O 16	IO15	IO16
11	I/O 13	I/O 14	IO13	IO14
12	I/O 11	I/O 12	IO11	IO12
13	I/O 9	I/O 10	IO9	IO10
14	I/O 7	I/O 8	IO7	IO8
15	I/O 5	I/O 6	IO5	IO6
16	I/O 3	I/O 4	IO3	IO4
17	I/O 1	I/O 2	IO1	IO2
18	NC	NC	Open	Open
19	Reserve	Reserve	Rsv2	Rsv3
20	Reserve	Reserve	Rsv4	Rsv5
21	Reserve	Reserve	Rsv6	Rsv7
22	NC	NC	Open	Open
23	PWR_S1	PWR_S2	PS1	PS2
24	PWR_F1	PWR_F2	PF1	PF2
25	PWR_F1	PWR_F2	PF1	PF2
26	Reserve	Reserve	Rsv8	Rsv9
27	RVS_S1	RVS_S2	RVSS1	RVSS2
28	RVS_F1	RVS_F2	RVSF1	RVSF2
29	Reserve	Reserve	Rsv10	Rsv11
30	Reserve	Reserve	Rsv12	Rsv13
31	AWG	GND_S	AWG1	HGND
32	DGT_F	DGT_S	DGT1	/DGT1

Please do not use gray filled rows as they are NC or Reserved by system.
Please refer to CX1000 user's manual about meaning and usage of signal name.

Table 5 FUNC connector signal and signal mark on board (128ch/256ch)

FUNC Connector			128ch/256ch							
			CN1		CN2		CN3		CN4	
	A	C	A	C	A	C	A	C	A	C
1	Reserve	NC	Rsv1	Open	Rsv1	Open	Rsv1	Open	Rsv1	Open
2	I/O 31	I/O 32	IO31_1	IO32_1	IO31_2	IO32_2	IO31_3	IO32_3	IO31_4	IO32_4
3	I/O 29	I/O 30	IO29_1	IO30_1	IO29_2	IO30_2	IO29_3	IO30_3	IO29_4	IO30_4
4	I/O 27	I/O 28	IO27_1	IO28_1	IO27_2	IO28_2	IO27_3	IO28_3	IO27_4	IO28_4
5	I/O 25	I/O 26	IO25_1	IO26_1	IO25_2	IO26_2	IO25_3	IO26_3	IO25_4	IO26_4
6	I/O 23	I/O 24	IO23_1	IO24_1	IO23_2	IO24_2	IO23_3	IO24_3	IO23_4	IO24_4
7	I/O 21	I/O 22	IO21_1	IO22_1	IO21_2	IO22_2	IO21_3	IO22_3	IO21_4	IO22_4
8	I/O 19	I/O 20	IO19_1	IO20_1	IO19_2	IO20_2	IO19_3	IO20_3	IO19_4	IO20_4
9	I/O 17	I/O 18	IO17_1	IO18_1	IO17_2	IO18_2	IO17_3	IO18_3	IO17_4	IO18_4
10	I/O 15	I/O 16	IO15_1	IO16_1	IO15_2	IO16_2	IO15_3	IO16_3	IO15_4	IO16_4
11	I/O 13	I/O 14	IO13_1	IO14_1	IO13_2	IO14_2	IO13_3	IO14_3	IO13_4	IO14_4
12	I/O 11	I/O 12	IO11_1	IO12_1	IO11_2	IO12_2	IO11_3	IO12_3	IO11_4	IO12_4
13	I/O 9	I/O 10	IO9_1	IO10_1	IO9_2	IO10_2	IO9_3	IO10_3	IO9_4	IO10_4
14	I/O 7	I/O 8	IO7_1	IO8_1	IO7_2	IO8_2	IO7_3	IO8_3	IO7_4	IO8_4
15	I/O 5	I/O 6	IO5_1	IO6_1	IO5_2	IO6_2	IO5_3	IO6_3	IO5_4	IO6_4
16	I/O 3	I/O 4	IO3_1	IO4_1	IO3_2	IO4_2	IO3_3	IO4_3	IO3_4	IO4_4
17	I/O 1	I/O 2	IO1_1	IO2_1	IO1_2	IO2_2	IO1_3	IO2_3	IO1_4	IO2_4
18	NC	NC	Open	Open	Open	Open	Open	Open	Open	Open
19	Reserve	Reserve	Rsv2	Rsv3	Rsv2	Rsv3	Rsv2	Rsv3	Rsv2	Rsv3
20	Reserve	Reserve	Rsv4	Rsv5	Rsv4	Rsv5	Rsv4	Rsv5	Rsv4	Rsv5
21	Reserve	Reserve	Rsv6	Rsv7	Rsv6	Rsv7	Rsv6	Rsv7	Rsv6	Rsv7
22	NC	NC	Open	Open	Open	Open	Open	Open	Open	Open
23	PWR_S1	PWR_S2	PS1	PS2	PS3	PS4	PS5	PS6	PS7	PS8
24	PWR_F1	PWR_F2	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8
25	PWR_F1	PWR_F2	PF1	PF2	PF3	PF4	PF5	PF6	PF7	PF8
26	Reserve	Reserve	Rsv8	Rsv9	Rsv8	Rsv9	Rsv8	Rsv9	Rsv8	Rsv9
27	RVS_S1	RVS_S2	RVSS1	RVSS2	RVSS3	RVSS4	RVSS5	RVSS6	RVSS7	RVSS8
28	RVS_F1	RVS_F2	RVSF1	RVSF2	RVSF3	RVSF4	RVSF5	RVSF6	RVSF7	RVSF8
29	Reserve	Reserve	Rsv10	Rsv11	Rsv10	Rsv11	Rsv10	Rsv11	Rsv10	Rsv11
30	Reserve	Reserve	Rsv12	Rsv13	Rsv12	Rsv13	Rsv12	Rsv13	Rsv12	Rsv13
31	AWG	GND_S	AWG1	HGND1	AWG2	HGND2	AWG3	HGND3	AWG4	HGND4
32	DGT_F	DGT_S	DGT1	/DGT1	DGT2	/DGT2	DGT3	/DGT3	DGT4	/DGT4

Please do not use gray filled rows as they are NC or Reserved by system.
Please refer to CX1000 user's manual about meaning and usage of signal name.

Table 6 FUNC connector signal and signal mark on board (256ch)

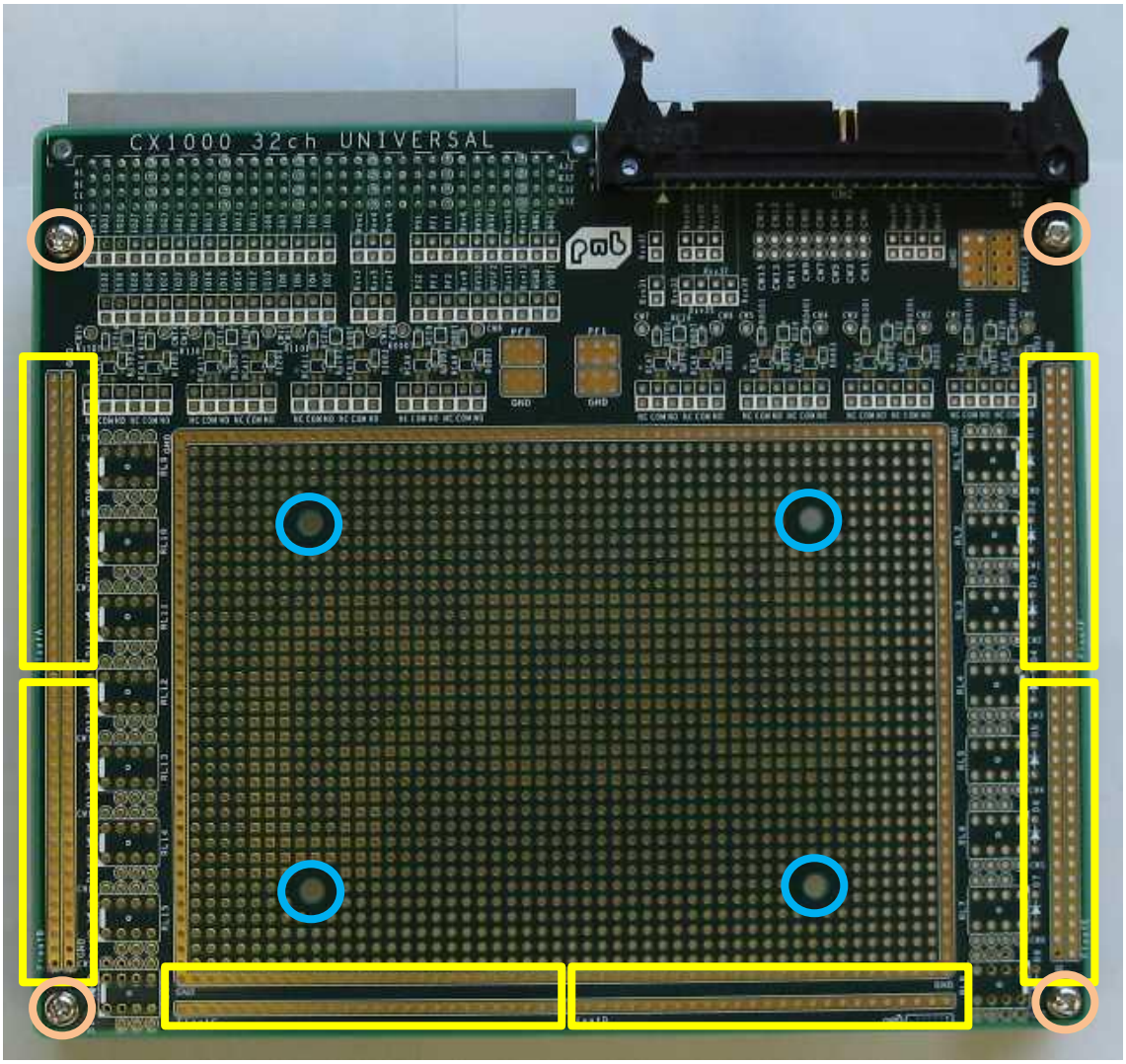
FUNC Connector			256ch							
			CN5		CN6		CN7		CN8	
	A	C	A	C	A	C	A	C	A	C
1	Reserve	NC	Rsv1	Open	Rsv1	Open	Rsv1	Open	Rsv1	Open
2	I/O 31	I/O 32	IO31_5	IO32_5	IO31_6	IO32_6	IO31_7	IO32_7	IO31_8	IO32_8
3	I/O 29	I/O 30	IO29_5	IO30_5	IO29_6	IO30_6	IO29_7	IO30_7	IO29_8	IO30_8
4	I/O 27	I/O 28	IO27_5	IO28_5	IO27_6	IO28_6	IO27_7	IO28_7	IO27_8	IO28_8
5	I/O 25	I/O 26	IO25_5	IO26_5	IO25_6	IO26_6	IO25_7	IO26_7	IO25_8	IO26_8
6	I/O 23	I/O 24	IO23_5	IO24_5	IO23_6	IO24_6	IO23_7	IO24_7	IO23_8	IO24_8
7	I/O 21	I/O 22	IO21_5	IO22_5	IO21_6	IO22_6	IO21_7	IO22_7	IO21_8	IO22_8
8	I/O 19	I/O 20	IO19_5	IO20_5	IO19_6	IO20_6	IO19_7	IO20_7	IO19_8	IO20_8
9	I/O 17	I/O 18	IO17_5	IO18_5	IO17_6	IO18_6	IO17_7	IO18_7	IO17_8	IO18_8
10	I/O 15	I/O 16	IO15_5	IO16_5	IO15_6	IO16_6	IO15_7	IO16_7	IO15_8	IO16_8
11	I/O 13	I/O 14	IO13_5	IO14_5	IO13_6	IO14_6	IO13_7	IO14_7	IO13_8	IO14_8
12	I/O 11	I/O 12	IO11_5	IO12_5	IO11_6	IO12_6	IO11_7	IO12_7	IO11_8	IO12_8
13	I/O 9	I/O 10	IO9_5	IO10_5	IO9_6	IO10_6	IO9_7	IO10_7	IO9_8	IO10_8
14	I/O 7	I/O 8	IO7_5	IO8_5	IO7_6	IO8_6	IO7_7	IO8_7	IO7_8	IO8_8
15	I/O 5	I/O 6	IO5_5	IO6_5	IO5_6	IO6_6	IO5_7	IO6_7	IO5_8	IO6_8
16	I/O 3	I/O 4	IO3_5	IO4_5	IO3_6	IO4_6	IO3_7	IO4_7	IO3_8	IO4_8
17	I/O 1	I/O 2	IO1_5	IO2_5	IO1_6	IO2_6	IO1_7	IO2_7	IO1_8	IO2_8
18	NC	NC	Open	Open	Open	Open	Open	Open	Open	Open
19	Reserve	Reserve	Rsv2	Rsv3	Rsv2	Rsv3	Rsv2	Rsv3	Rsv2	Rsv3
20	Reserve	Reserve	Rsv4	Rsv5	Rsv4	Rsv5	Rsv4	Rsv5	Rsv4	Rsv5
21	Reserve	Reserve	Rsv6	Rsv7	Rsv6	Rsv7	Rsv6	Rsv7	Rsv6	Rsv7
22	NC	NC	Open	Open	Open	Open	Open	Open	Open	Open
23	PWR_S1	PWR_S2	PS9	PS10	PS11	PS12	PS13	PS14	PS15	PS16
24	PWR_F1	PWR_F2	PF9	PF10	PF11	PF12	PF13	PF14	PF15	PF16
25	PWR_F1	PWR_F2	PF9	PF10	PF11	PF12	PF13	PF14	PF15	PF16
26	Reserve	Reserve	Rsv8	Rsv9	Rsv8	Rsv9	Rsv8	Rsv9	Rsv8	Rsv9
27	RVS_S1	RVS_S2	RVSS1	RVSS2	RVSS3	RVSS4	RVSS5	RVSS6	RVSS7	RVSS8
28	RVS_F1	RVS_F2	RVSF1	RVSF2	RVSF3	RVSF4	RVSF5	RVSF6	RVSF7	RVSF8
29	Reserve	Reserve	Rsv10	Rsv11	Rsv10	Rsv11	Rsv10	Rsv11	Rsv10	Rsv11
30	Reserve	Reserve	Rsv12	Rsv13	Rsv12	Rsv13	Rsv12	Rsv13	Rsv12	Rsv13
31	AWG	GND_S	AWG5	HGND5	AWG6	HGND6	AWG7	HGND7	AWG8	HGND8
32	DGT_F	DGT_S	DGT5	/DGT5	DGT6	/DGT6	DGT7	/DGT7	DGT8	/DGT8

Please do not use gray filled rows as they are NC or Reserved by system.
Please refer to CX1000 user's manual about meaning and usage of signal name.

4-3-5. Floating Land

On every universal board, several floating lands are prepared. These lands are intended to set intermediate voltage and supply this voltage to circuit on perforated area. This is one application to use this floating land.
Number of Floating Land is varied on board size. Floating lands are marked as "Float*". * is character from "A" to "H", depending on board size.

Fig. 12 Floating land and holes



Floating Land

Board fixing holes (M3: 32ch:170x139, 128ch:225x180(left), 165(Right), 256ch:350x220)

Pillar holes for daughter board (85x62)

4-3-6. Inhibited pins in FUNC connection area

Reserve

Reserve pins are positioned at FUNC connection areas. At this moment, please do not use these through hole.

NC

NC pins in FUNC connector are not extracted to FUNC connection area.

4-4. Mechanical structure

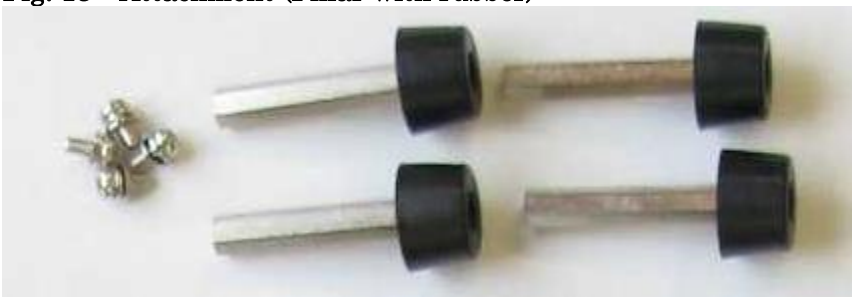
4-4-1. Universal board pillar

Pillars are installed with universal board to prevent wiring in bottom side of board or to open space for cables to CX1000 system. 4 holes are prepared at each corners of universal board for these pillars. In Fig. 12, these holes are explained as board fixing hole and marked as ○.
When you need to fix universal board to base plate, please use these holes.

Holes on each 4 corner, please screw pillar with M3 screws attached. Parts are shown in Fig. 13.
Hole size: 3.2mm diameter for M3 screw
Hole pitch:

32ch	170x139
128ch	225x180(left), 165(Right)
256ch	350x220

Fig. 13 Attachment (Pillar with rubber)



4-4-2. Holes for daughter board

For additional board for larger device area is considered, 4 holes are prepared. This hole pitch is corresponding to Commercial available universal board supplied by Sunhayato Corp. (ICB-93S etc.)
http://www.sunhayato.co.jp/index.php

4-5. Board dimension

Mechanical dimensions are listed in Table 7

Table 7 Mechanical dimension of universal boards

Universal board	Board size (mm)	Perforated area (mm)	Pillar holes(mm)	Daughter board hole pitch(mm)
32ch	180x155	124.46x86.36	170x130	85x62
128ch	235x190	152.4x88.9	225x165	85x62
256ch	360x230	233.68x96.52	350x220	85x62, 85x62 spacing between 2 sets; 35mm

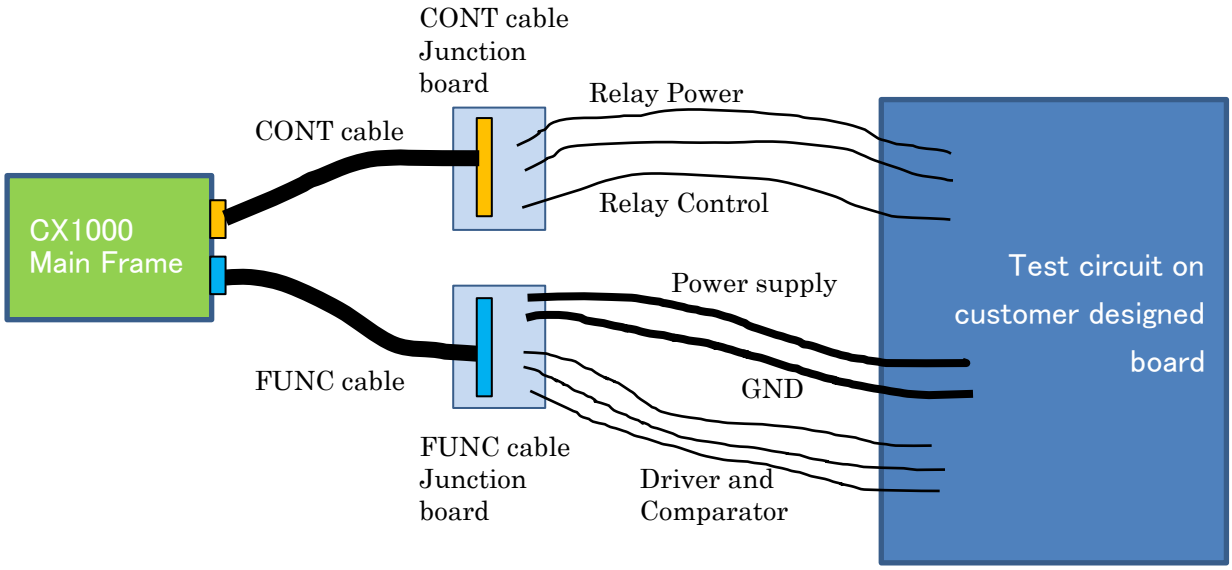
5. Cable junction boards

Fig. 14 shows one application of connection between CX1000 and customer designed board by using cable junction board.

5-1. Applications of cable junction board

1. All the signal in the connector are extracted to pads, so that test circuit on customer designed board can be tested on CX1000 by connecting signal between cable junction board and customer designed board.
2. Cable junction board has one connector. By installing same connector on board, CONT cable can be extended if needed. In this case, please consult to PWB.

Fig. 14 Connection of cable junction board



5-2. Connection using cable junction board

5-2-1. Connection to CX1000

Connect FUNC cable and CONT cable from CX1000 to connector on cable junction board.

5-2-2. Signal connection from cable junction board

Through holes are located at center of both junction boards to connecting cables. GND through holes are located besides of signal hole. PWB supply coaxial cable set which meet for this connection. Signal position is listed in Table 8 for CONT connector and Table 9 for FUNC connector.
By connecting signal from junction board to customer designed board, you can test your board by CX1000 sysytem.

5-2-3. Signal on CONT cable junction board

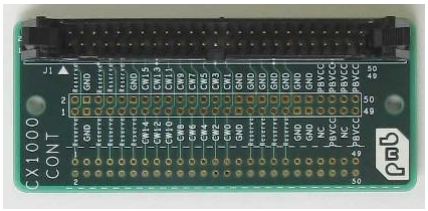
Table 8 Signal on CONT cable junction board

CONT Connector			
No	Assign	Assign	No
1	Reserve	Reserve	2
3	GND	GND	4
5	Reserve	Reserve	6
7	Reserve	Reserve	8
9	Reserve	Reserve	10
11	Reserve	Reserve	12
13	CW14	CW15	14
15	CW12	CW13	16
17	CW10	CW11	18
19	CW8	CW9	20
21	CW6	CW7	22
23	CW4	CW5	24
25	CW2	CW3	26
27	CW0	CW1	28
29	GND	GND	30
31	Reserve	GND	32
33	Reserve	GND	34
35	Reserve	GND	36
37	Reserve	GND	38
39	GND	GND	40
41	GND	GND	42
43	NC	PBVCC	44
45	PBVCC	PBVCC	46
47	NC	PBVCC	48
49	PBVCC	PBVCC	50

Please do not use gray filled rows as they are NC or Reserved by system.
Please refer to CX1000 user's manual about meaning and usage of signal name.

5-2-4. CONT junction board

Fig. 15 CONT junction board



5-2-5. Signal on FUNC cable junction board

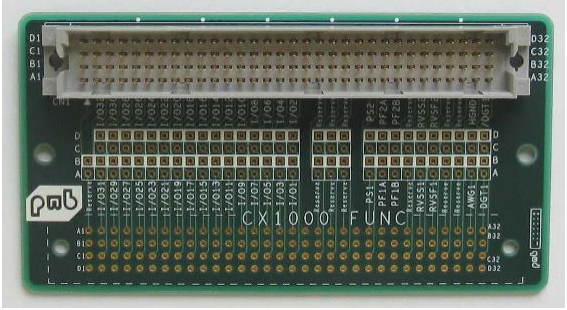
Table 9 Signal on FUNC cable junction board

FUNC Connector		
	A	C
1	Reserve	
2	I/O 31	I/O 32
3	I/O 29	I/O 30
4	I/O 27	I/O 28
5	I/O 25	I/O 26
6	I/O 23	I/O 24
7	I/O 21	I/O 22
8	I/O 19	I/O 20
9	I/O 17	I/O 18
10	I/O 15	I/O 16
11	I/O 13	I/O 14
12	I/O 11	I/O 12
13	I/O 9	I/O 10
14	I/O 7	I/O 8
15	I/O 5	I/O 6
16	I/O 3	I/O 4
17	I/O 1	I/O 2
18		
19	Reserve	Reserve
20	Reserve	Reserve
21	Reserve	Reserve
22		
23	PWR_S1	PWR_S2
24	PWR_F1	PWR_F2
25	PWR_F1	PWR_F2
26	Reserve	Reserve
27	RVS_S1	RVS_S2
28	RVS_F1	RVS_F2
29	Reserve	Reserve
30	Reserve	Reserve
31	AWG	GND_S
32	DGT_F	DGT_S

Column B is the GND for column A and column D is the GND for column C.
Please do not use gray filled rows as they are NC or Reserved by system.
Please refer to CX1000 user's manual about meaning and usage of signal name.

5-2-6. FUNC cable junction board

Fig. 16 FUNC cable junction board



5-3. Board dimension

Table 10 Board dimension

	dimension	Hole pitch	Mounted connector
FUNC cable junction board	106x56	96	1
CONT cable junction board	88x38	78	1

5-4. Other specification

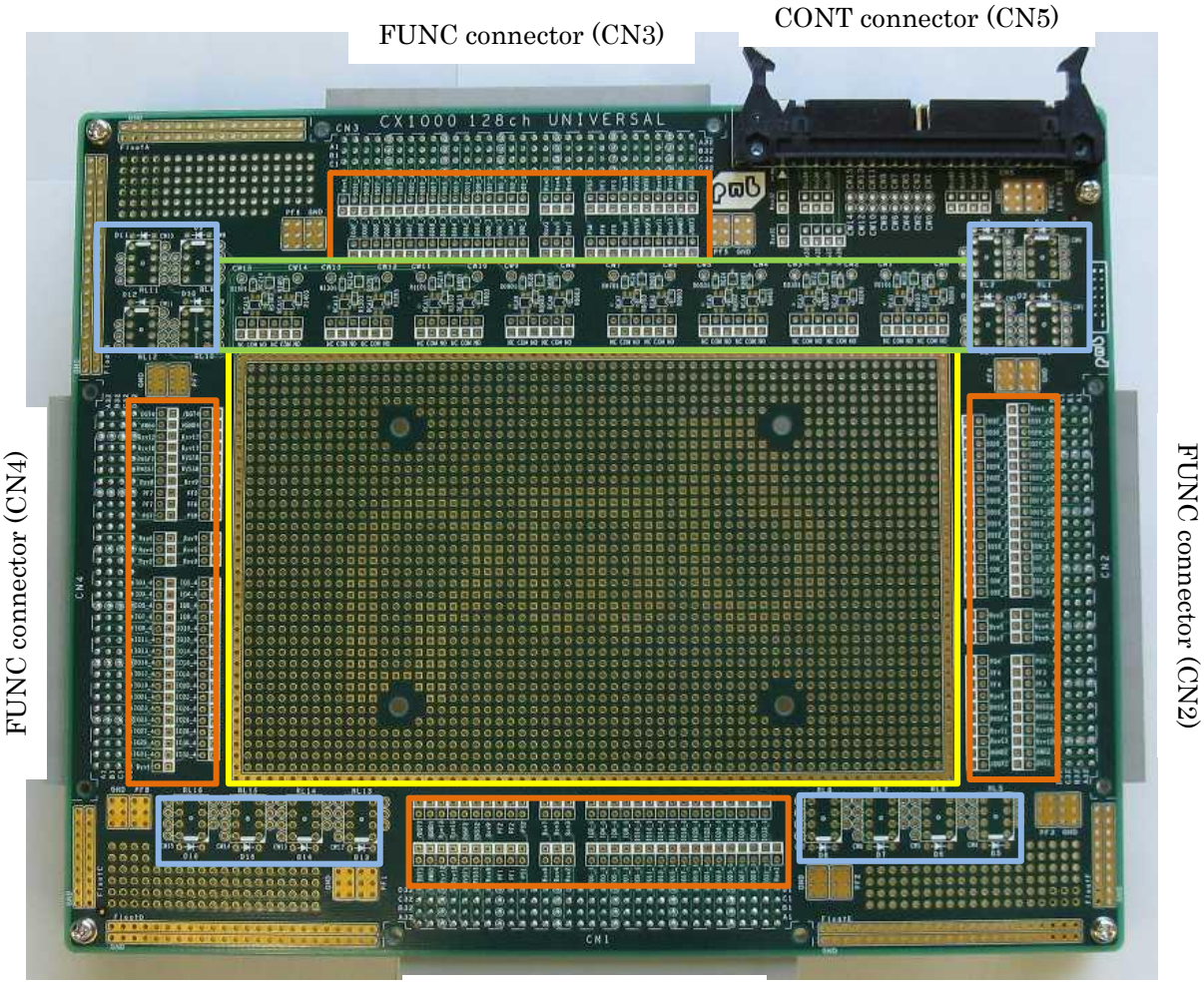
Additional connector can be mounted both on CONT and FUNC cable junction board

6. Reference

For your reference, 128ch and 256ch board is shown in Fig. 17　128ch universal boardFig. 17 and Fig. 18, respectively.

6-1. 128ch universal board

Fig. 17　128ch universal board



Perforated board area

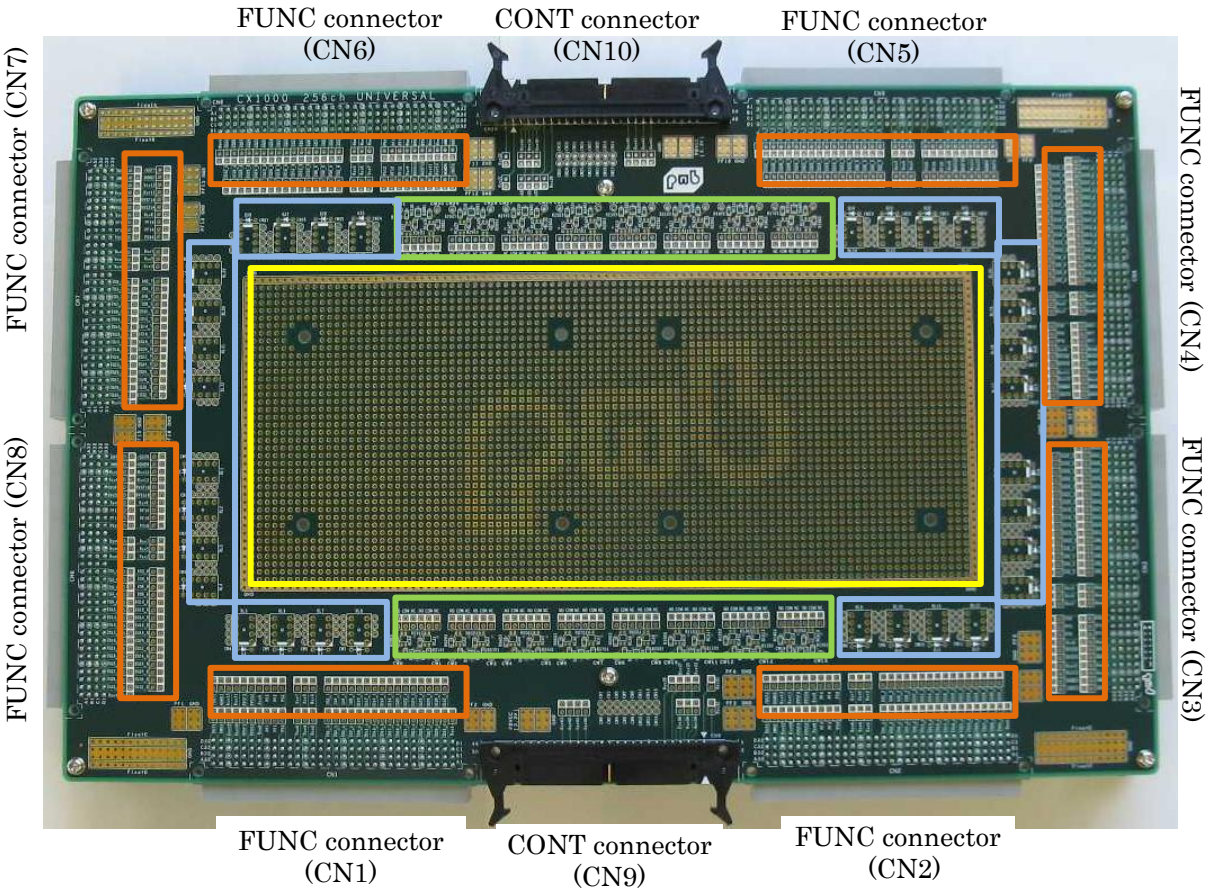
Prewired PhotoMOS Relay area

FUNC Connector connection area

Prewired Mechanical Relay area

6-2. 256ch universal board

Fig. 18　256ch universal board



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