

# Connection Conversion Board for SMC-P Series

## CCB-SMC1 Instruction Manual

© CONTEC

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### Preface

Thank you for purchasing the CCB-SMC1.

This product is an optional accessory to the SMC-2P(PCI) or SMC-4P(PCI) board to connect it easily and correctly to external devices such as a motor driver unit, a limit sensor, and a power supply. The CCB-SMC1 provides functions optimized for the characteristics of external devices, dramatically reducing a man-hour for wiring.

### Features

- Connector for motor driver unit
  - Connects a motor driver unit to the CCB-SMC1.
  - Enables connection to the servo motor or stepping motor driver unit.
  - DB-37 connector which can be easily machined and manufactured.
  - Optimized in pin-signal assignment for easier connection to the controller connector of the motor driver unit.
- Jumpers
  - Used to switch wiring for optimization, depending on the I/O circuit of the motor driver unit.
  - Supports the line driver and open collector types of encoder.
  - Capable of easy switching between the external and internal power supplies depending on the input circuit (resistor) of the motor driver unit.
- Limit sensor connector
  - Consists of terminals to connect a limit sensor to the CCB-SMC1.
  - The terminals are screw types, enabling easy and secure connection of the limit sensor.
  - Each terminal (signal) is provided with a power supply, allowing the CCB-SMC1 to be connected easily to a sensor which requires a power supply.
- External power supply connector
  - Consists of terminals to supply power to the CCB-SMC1.
  - The POWER LED remains on while the CCB-SMC1 is powered, making it easy to check the power-on/off state.
  - The terminals are screw types, enabling easy and secure connection of the power supply.
- DIN rail mounting adapter
  - The DIN rail adapter "DIN-ADP1" is available as an option, which allows the CCB-SMC1 to be mounted on a 35mm DIN rail.

### Specifications

Table 1. Major Specifications

Item	Specification
Operating conditions	0-50°C, 20-90% (No condensation allowed)
Outside dimensions (mm)	105.0 x 230.0 x 25.5
Board weight	360g

Table 2. Specifications of Interface Connector (CN1)

On-board connector	96pin half-pitch male connector PCR-E96RD (manufactured by HONDA TSUSHIN KOGYO CO., LTD.) or equivalent
Mating connector	96pin half-pitch female connector PCR-E96FA (manufactured by HONDA TSUSHIN KOGYO CO., LTD.) or equivalent

Table 3. Specifications of Interface Connectors (CN2-CN5)

On-board connector	37pin female D-type DC-37ST-N (manufactured by Japan Aviation Electronics Industry, Limited) or equivalent
Lock nut	Screw size #4-40UNC GM-25HU (manufactured by HONDA TSUSHIN KOGYO CO., LTD.) or equivalent
Mating connector	37pin male D-type DCSP-JB37PF (manufactured by Japan Aviation Electronics Industry, Limited), 747306-1 manufactured by AMP, etc.

Table 4. Specifications of Terminal Connectors (CN6-CN10)

Terminal connector	ML-40S1BYF manufactured by Satoh Parts or equivalent	Mating spade terminal	G3A manufactured by Nippon Crimp Terminals or equivalent
Connector dimensions [mm]		Spade terminal dimensions [mm]	
	Terminal screw : M3		

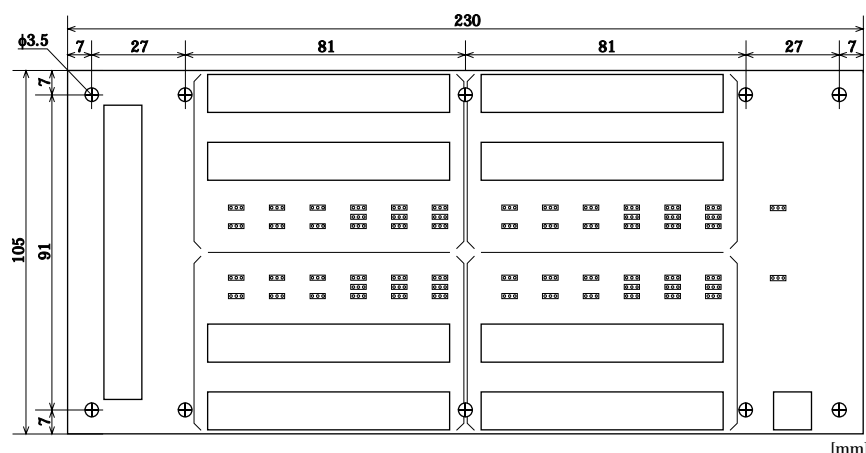


Figure 2. Outside Dimensions of CCB-SMC1

### System Configuration

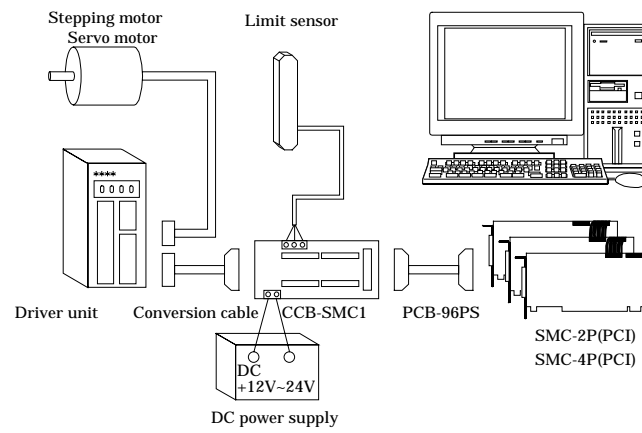


Figure1. System Configuration

### CCB-SMC1 Connection Cable (Option)

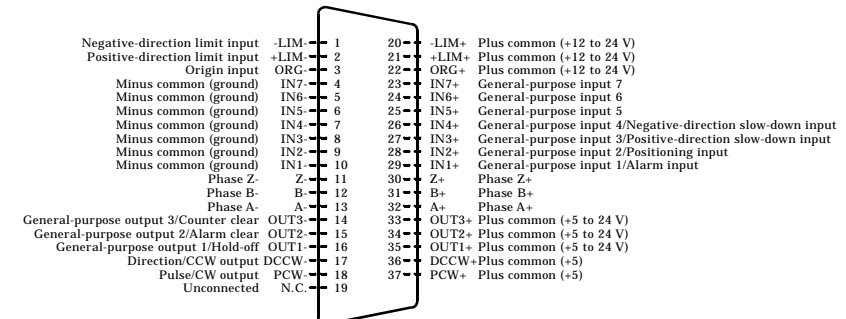
The CCB-SMC1 is not bundled with a board connection cable. The maximum signal extensible distance satisfying the signal specifications of the SMC-2P(PCI) or SMC-4P(PCI) is 3m. Purchase the appropriate cable depending on the application, selected from among the optional cables listed below.

#### Shielded cables with 96-pin half-pitch connectors at both ends

- PCB96PS-1.5 (1.5m)
- PCB96PS-3 (3m)

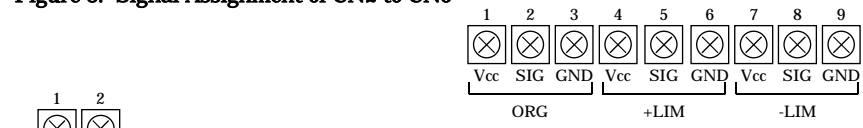
### Terminal-Signal Assignment of Each Connector

The pins and terminals of each connector are assigned to signals as illustrated below. For pin-signal assignment of CN1, refer to the "Interface Connector Pin Assignment to Signals" section of the documentation for the SMC-2P(PCI) or SMC-4P(PCI).



- On-board receptacle viewed from the plug side

Figure 3. Signal Assignment of CN2 to CN5



External power input terminals

Note!

The Vcc terminal outputs power supplied at +12 to +24V from CN10.

Figure 4. Signal Assignment of CN10

Figure 5. Signal Assignment of CN6 to CN9

### Examples of Connection to Driver Unit

Shown below are examples of connection between the CCB-SMC1 and the driver unit. Note that these examples show the connection at channel 0.

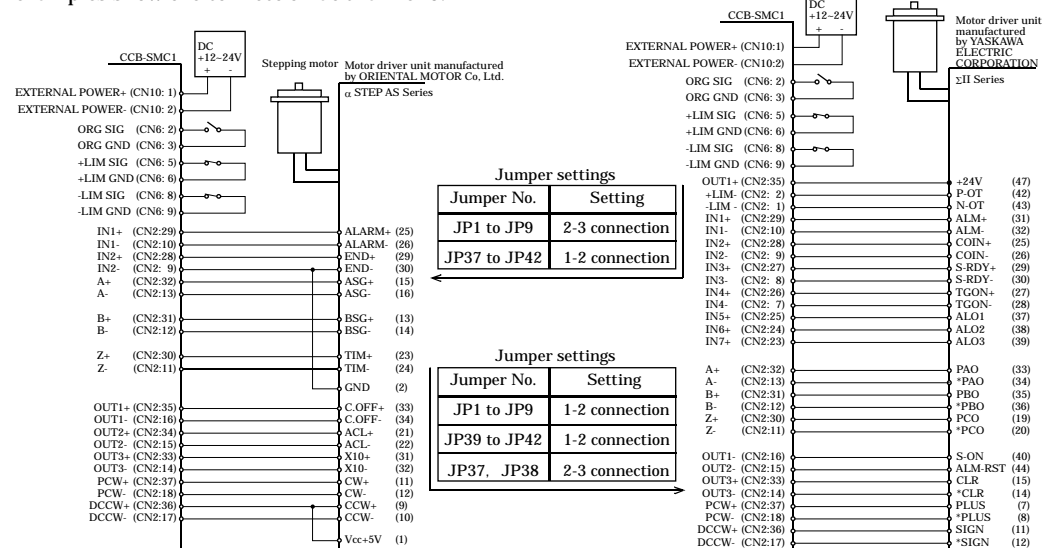


Figure 6. Example of Connection to Stepping Motor Driver Unit (α STEP AS Series)

Figure 7. Example of Connection to Servo Motor Driver Unit (Σ II Series)

**Limit sensor connectors (CN6, CN7, CN8, CN9)**

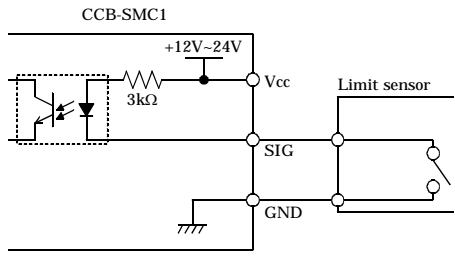
These connectors consist of terminals for connection with the positive-direction limit sensor, negative-direction limit sensor and origin limit sensor.

If the sensor used requires power (12 to 24 VDC), the connector can supply power between Vcc (positive side) and GND (negative side). Do not connect Vcc (positive side) to GND (negative side) when making connections.

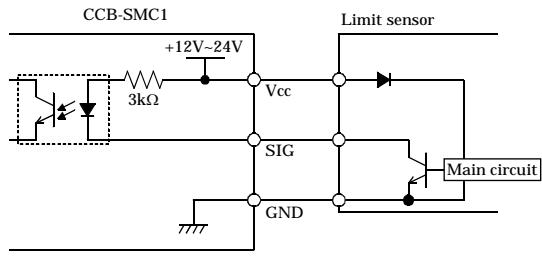
Channel No.	Connector No.		
	Positive-direction limit	Negative-direction limit	Origin limit
CH0	CN6 - +LIM	CN6 - -LIM	CN6 - ORG
CH1	CN7 - +LIM	CN7 - -LIM	CN7 - ORG
CH2	CN8 - +LIM	CN8 - -LIM	CN8 - ORG
CH3	CN9 - +LIM	CN9 - -LIM	CN9 - ORG

**(Connection examples)**

• No power supply is required.



• A power supply is required.



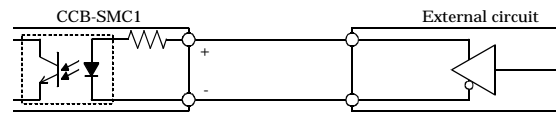
**Encoder input source selection jumpers (JP1 to JP36)**

The signal outputs from the encoder on the motor driver unit are classified into two types: line driver type and open collector type. The input circuit required is different between the two types. The CCB-SMC1 can switch between the two input circuits using jumpers. To use the line driver type, connect bits 1-2 of each jumper. To use the open collector type, connect bits 2-3 of the jumper. Note that all of the jumpers for a signal in each channel must be set the same. See the following example of setting the jumpers for phase A in channel 0.

Channel No.	Jumper No.									Line driver type	Open collector type
	A			B			Z				
CH0	JP 1	JP 2	JP 3	JP 4	JP 5	JP 6	JP 7	JP 8	JP 9	JP1 <input type="checkbox"/> <input type="checkbox"/>	JP1 <input type="checkbox"/> <input type="checkbox"/>
CH1	JP10	JP11	JP12	JP13	JP14	JP15	JP16	JP17	JP18	JP2 <input type="checkbox"/> <input type="checkbox"/>	JP2 <input type="checkbox"/> <input type="checkbox"/>
CH2	JP19	JP20	JP21	JP22	JP23	JP24	JP25	JP26	JP27	JP3 <input type="checkbox"/> <input type="checkbox"/>	JP3 <input type="checkbox"/> <input type="checkbox"/>
CH3	JP28	JP29	JP30	JP31	JP32	JP33	JP34	JP35	JP36	1 2 3	1 2 3

**(Connection examples)**

• Line driver type (A, B, Z)

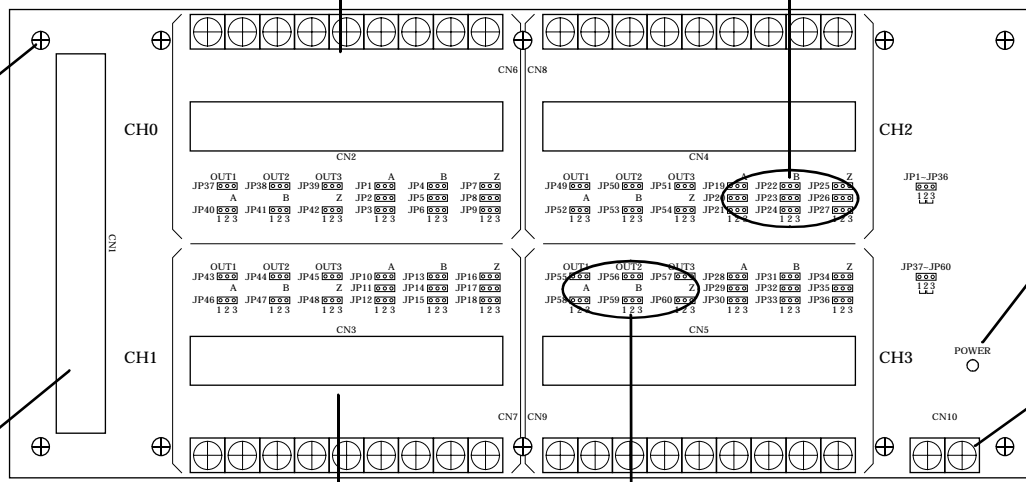


• Open collector type (A, B, Z)

See the "Voltage source selection jumpers" section.

**DIN rail mounting hole**

The CCB-SMC1 can be mounted on a DIN rail by using the DIN rail mounting adapter (DIN-ADP1) available as an option.



**External power indicator LED**  
This LED lets you check whether power has been supplied to CN10.

**External power input connector (CN10)**  
This connector supplies power to the CCB-SMC1. Use a supply voltage between 12 and 24 VDC. When connecting an external power supply, check the polarities of the terminals not to connect the positive and negative sides.

**SMC-2P(PCI)/SMC-4P(PCI) connector (CN1)**

The connector connects the CCB-SMC1 to the SMC-2P(PCI) or SMC-4P(PCI) board. For connection to either board, use a cable in the PCB-96PS series.

**Voltage source selection jumpers (JP37 to JP60)**

The supply voltage required for general-purpose output and encoder input signals can be jumper-selected. Check the interface circuit of the driver unit before making the required settings. The internal 5V power supply (+5V power supply in the PC) or the 12-24V external power supply input to CN10 can be selected by setting the relevant jumper. To use the internal power supply, connect bits 1-2 of the jumper. To use the external power supply, connect bits 2-3 of the jumper. See the following examples of setting JP37 for OUT1 in channel 0.

**Notes!**

- \* Up to 1A can be supplied with the internal power supply used.
- \* To use an external power supply for encoder input signals, an externally inserted resistor (designated as R) is required separately.

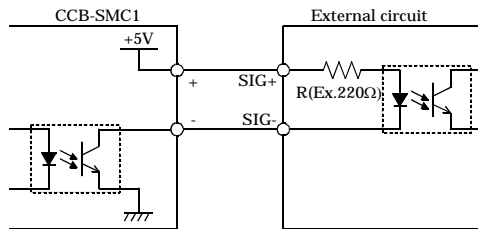
Channel No.	Jumper No.					
	OUT1	OUT2	OUT3	A	B	Z
CH0	JP37	JP38	JP39	JP40	JP41	JP42
CH1	JP43	JP44	JP45	JP46	JP47	JP48
CH2	JP49	JP50	JP51	JP52	JP53	JP54
CH3	JP55	JP56	JP57	JP58	JP59	JP60

Use internal +5V power supply	Use external 12-24V power supply
JP37 <input type="checkbox"/> <input type="checkbox"/>	JP37 <input type="checkbox"/> <input type="checkbox"/>
1 2 3	1 2 3

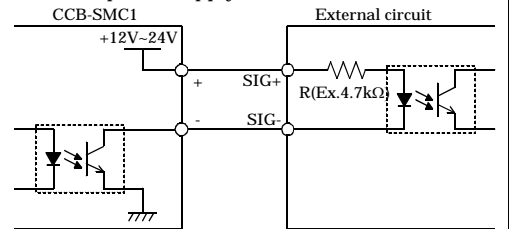
**(Connection examples)**

**1. General-purpose output signal (OUT1, OUT2, OUT3)**

• Jumper connection for using the internal 5V power supply: 1-2

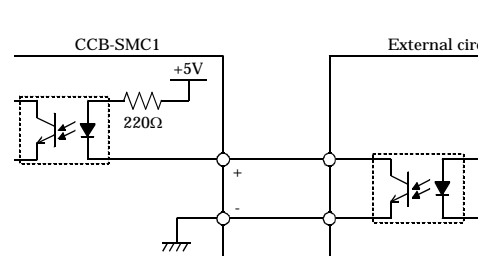


• Jumper connection for using the external 12-24V power supply: 2-3

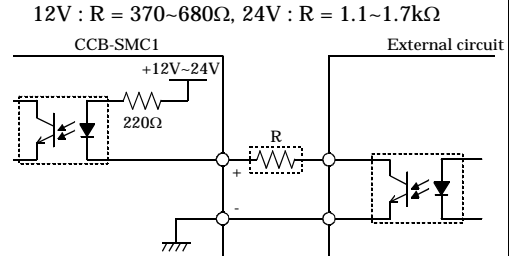


**2. Encoder input signal (A, B)**

• Jumper connection for using the internal 5V power supply: 1-2

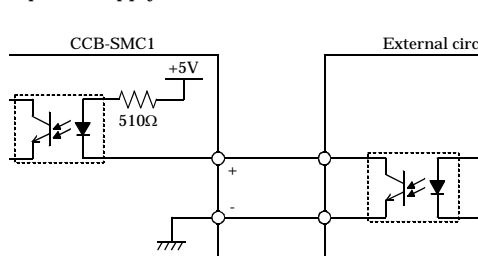


• Jumper connection for using the external 12-24V power supply: 2-3

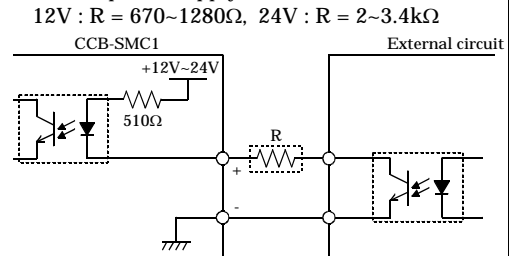


**3. Encoder input signal (Z)**

• Jumper connection for using the internal 5V power supply: 1-2



• Jumper connection for using the external 12-24V power supply: 2-3



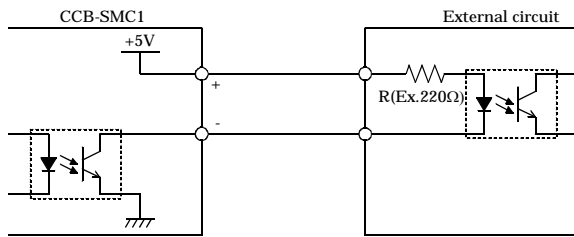
**Motor driver unit connectors (CN2, CN3, CN4, CN5)**

Each of these connectors is connected to the control connector on the driver unit of the stepping motor or servo motor. These connectors are positioned for optimized layout for easier connection to the driver unit. You should prepare a conversion cable to connect the connector on the CCB-SMC1 to the control connector on the driver unit. It will reduce a man-hour for wiring.

Channel No.	Connector No.
CH0	CN2
CH1	CN3
CH2	CN4
CH3	CN5

**(Connection examples)**

• Pulse output circuit (PCW, DCCW)



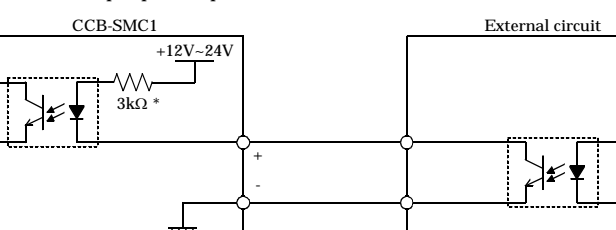
• General-purpose output circuit

See the "Voltage source selection jumpers" section.

• Encoder input circuit

See the "Encoder input source selection jumpers" or "Voltage source selection jumpers" section.

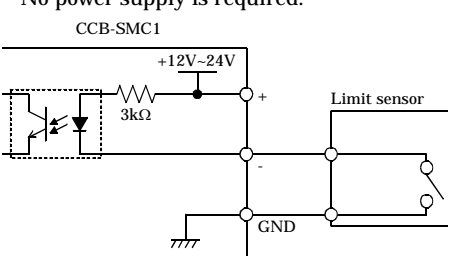
• General-purpose input circuit (IN1-IN7)



\* 1.8kΩ only for IN2

• Limit input circuit (+LIM, -LIM, ORG)

• No power supply is required.



• A power supply is required.

