

Digital Output Board with Opto-Isolation for PCI Express DO-128L-PE



* Specifications, color and design of the products are subject to change without notice.

Features

Opto-coupler isolated open-collector output (current sink type)
DO-128L-PE has the 128ch of opto-coupler isolated open-collector output (current sink type) whose response time is 200μsec. Common terminal provided per 16channels, capable of supporting a different external power supply. Supporting driver voltages of 12 - 24 VDC for I/O.

Opto-coupler bus isolation

As the PCI Express bus (PC) is isolated from the output interfaces by opto-couplers, this product has excellent noise performance.

Windows/Linux support device driver

Using the device driver API-TOOL makes it possible to create applications of Windows/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Zener diode for surge voltage protection and the circuit for overcurrent protection

Zener diodes are connected to the output circuits to protect against surge voltages. In addition, the output circuit, it attaches the overcurrent protection circuit at the output 8-channel unit. The output rating is max. 35VDC, 100mA per channel.

Functions and connectors are compatible with PCI compatible board PIO-64/64L(PCI)H Series.

DO-128L-PE : The functions same with PCI compatible board PO-128L(PCI)H are provided.

In addition, as there is compatibility in terms of connector shape and pin assignments, it is easy to migrate from the existing system.

Packing List

Product ...1

Please read the following ... 1

This product is a PCI Express bus-compliant interface board for output of digital signals. This product can output digital signals at 12 - 24VDC.

DO-128L-PE features 128 opto-coupler isolated open-collector outputs (current sink type). In addition, output transistor protection circuit (surge voltage protection and overcurrent protection).

Windows/Linux device driver is supported with this product.

*The contents in this document are subject to change without notice.

*Visit the CONTEC website to check the latest details in the document.

*The information in the data sheets is as of February 2024.

Specification

Function Specifications

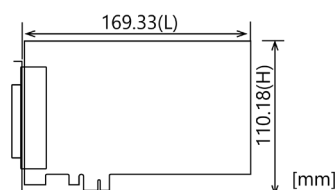
Item		Specifications
Output	Type	Opto-Isolated Open Collector Output (current sinking type) (Negative logic *1)
	Number of Channels	128ch (One common power supply per 16 channels)
	Output rated voltage	35VDC (Max)
	Output rated current	100mA/channel (Max.)
	Residual voltage with output on	0.5V or less (Output current ≤ 50mA), 1.0V or less (Output current ≤ 100mA)
	Surge protector	Zener diode RD47FM(Renesas) or equivalent
	Response time	200μsec within
Common	Connecting distance	50m (Typ.)(depending on wiring environment)
	I/O address	Any 32-byte boundary
	Interrupt level	Not used
	Boards in one system	Maximum of 16 boards can be install in a same system.
	Isolated voltage	250Vrms
	External circuit power supply	12 - 24VDC (±10%)
	Power consumption	3.3VDC 600mA (Max)
	Bus specification	PCI Express Base Specification Rev. 1.0a x1
	Dimension (mm)	169.33(L) x 110.18(H)
	Weight	215g

*1 Data "0" and "1" correspond to the High and Low levels, respectively.

Installation Environment Requirements

Item	Specifications
Operating ambient temperature	0 - +50°C
Operating ambient humidity	10 - 90%RH (No condensation)
Floating dust particles	Not to be excessive
Corrosive gases	None
Standard	VCCI Class A, CE Marking (EMC Directive Class A, RoHS Directive), UKCA

Physical Dimensions



The standard outside dimension (L) is the distance from the end of the card to the outer surface of the slot cover.

Support Software

Name	Contents	How to get
Windows Version Digital I/O Driver software API-DIO(WDM)	The Windows device driver is provided as a form of Windows API functions. Various sample programs such as C# and Visual Basic .NET, Visual C++ and Python etc. and diagnostic program useful for checking operation is provided.	Download from the CONTEC website *1
Linux Version Digital I/O Driver software API-DIO(LNX)	The Linux device driver is provided as a shared library. The software includes various sample programs such as gcc (C, C++) and Python programs, as well as a configuration tool to configure the device settings.	Download from the CONTEC website *1
Software Development Tool Kits (SDK) and Support Software	In addition to the device drivers, we offer many software programs for using CONTEC devices in an easier manner.	Download from the CONTEC website *2

*1 Download the files from the following URL.

<https://www.contec.com/download/>

*2 For supported software, search the CONTEC website for this product and view the product page.

<https://www.contec.com/>

Optional Products

Product Name	Model type	Description
Shielded Cable With Two 100pin Connector	PCB100PS-0.5	0.5m
	PCB100PS-1.5	1.5m
	PCB100PS-3	3m
	PCB100PS-5	5m
Connection Conversion Shield Cable (100P→96P)	PCB100/96PS-1.5	1.5m
	PCB100/96PS-3	3m
	PCB100/96PS-5	5m
Flat Cable with One 100-Pin Connector	PCA100P-1.5	1.5m
	PCA100P-3	3m
Connection Conversion Shield Cable (100pin→37pin D-SUB x2)	PCB100WS-1.5	1.5m
	PCB100WS-3	3m
	PCB100WS-5	5m
Screw Terminal (M3 * 100)	EPD-100A	*1 *2 *5
Screw Terminal (M3 * 96)	EPD-96A	*1 *3 *5
Terminal Unit for Relay Terminal Banks	EPD-96	*3 *5
Screw Terminal (M3 * 37P)	EPD-37A	*1 *4 *6
Screw Terminal (M3.5 * 37)	EPD-37	*3 *5
Screw Terminal	DTP-64A	*4 *6
General Purpose Terminal	DTP-3C	*4 *6
Screw Terminal	DTP-4C	*4 *6
Signal monitor Accessory for Digital I/O (64bits)	CM-64L	*3 *5
Signal monitor Accessory for Digital I/O (32bits)	CM-32L	*4 *6
Connector Conversion Board (96pin→37pinx2)	CCB-96	*3 *5

*1 "Spring-up" type terminal is used to prevent terminal screws from falling off.

*2 PCB100PS optional cable is required separately.

*3 PCB100/96PS optional cable is required separately.

*4 PCB100WS optional cable is required separately.

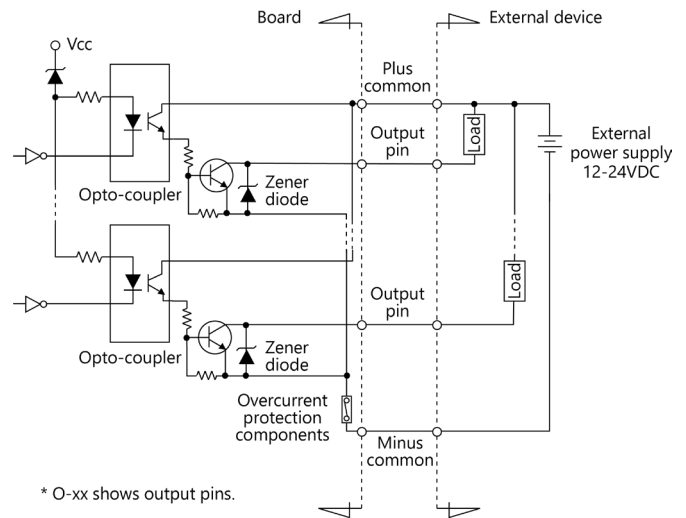
*5 If using both the CNA and CNB connectors, two each of the terminal block and cable sets are required.

*6 If using both the CNA and CNB connectors, two cable sets are required. You will also require sufficient terminal blocks for the number of I/O points you are using.

Connecting Output Signals

Output Circuit

Connect the output signals to a current-driven controlled device such as a relay or LED. The connection requires an external power supply to feed currents. The product controls turning on/off the current-driven controlled device using a digital value.



The signal output section is an opto-coupler isolated, open-collector output (current sink type). Driving the output section requires an external power supply. The rated output current per channel is 100mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5V or less at an output current within 50mA or at most 1.0V at an output current within 100mA.

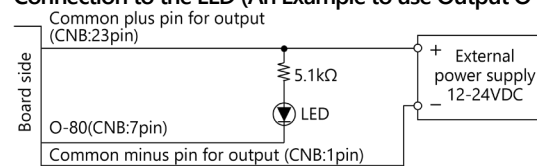
A zener diode is connected to the output transistor for protection from surge voltages.

An overcurrent protection component is provided for every 8 output transistors.

CAUTION

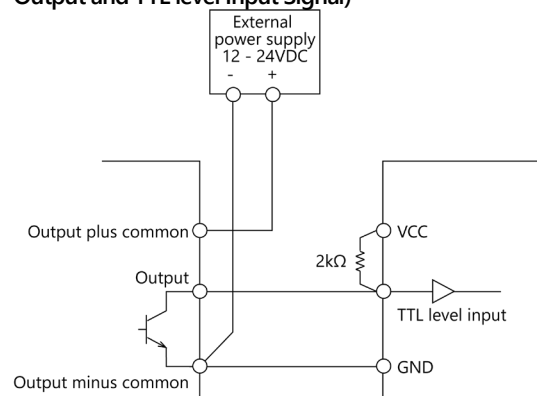
When the PC is turned on, all output are reset to OFF.

Connection to the LED (An Example to use Output O-80)

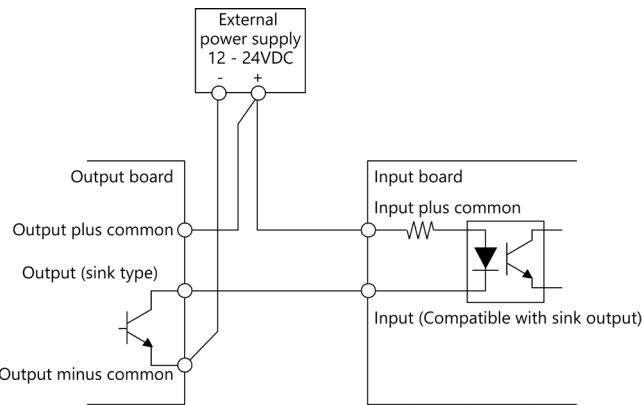


When "1" is output to a relevant bit, the corresponding LED comes on. When "0" is output to the bit, in contrast, the LED goes out.

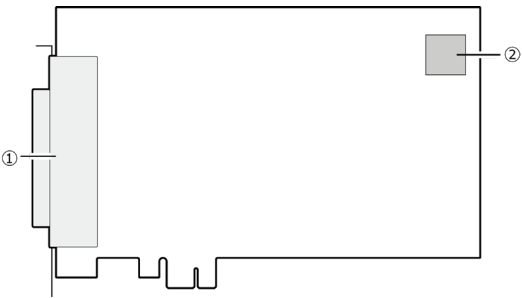
Example of Connection to TTL Level Input (Connection Example of Output and TTL level Input Signal)



Connecting the Sink Type Output and Sink Output Support Input
The following example shows a connection between a sink type output (output board) and a sink output support input (input board). Refer to this connection example when you connect such boards to each other.

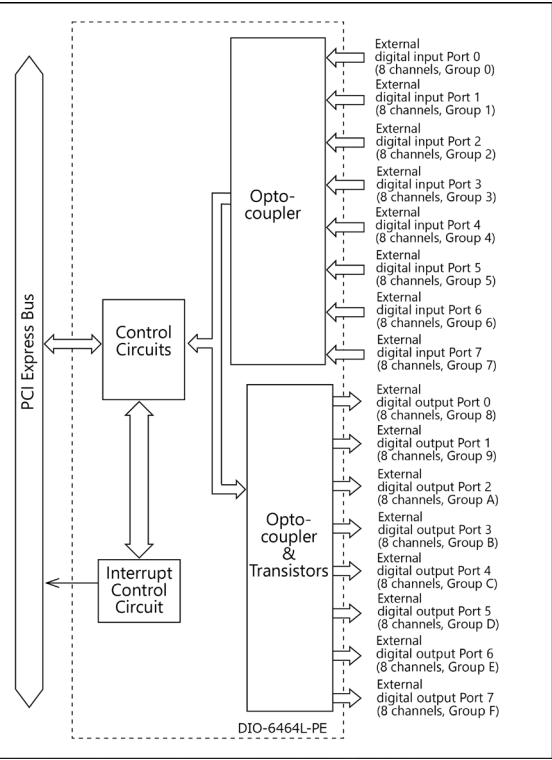


Nomenclature of Product Components

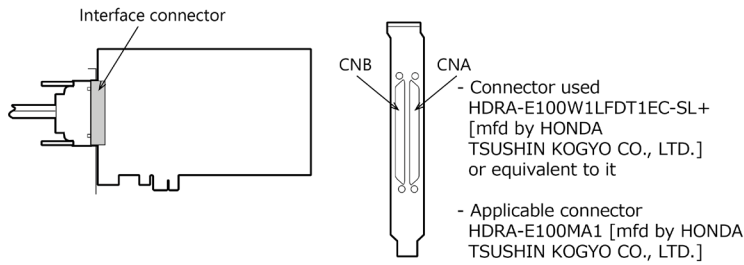


No.	Name
1	Interface Connector
2	Board ID Setting Switch

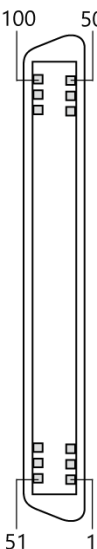
Block Diagram

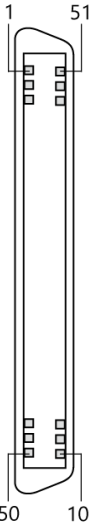


Connecting an Interface Connector



Layout on the Interface Connector(CNA, CNB)

CNB									
Common plus pin for +E/+F output ports	P-E/F	100		50	P-A/B	Common plus pin for +A/+B output ports			
	P-E/F	99		49	P-A/B				
+F port (Output)	O-F7	98		48	O-B7	+B port (Output)			
	O-F6	97		47	O-B6				
	O-F5	96		46	O-B5				
	O-F4	95		45	O-B4				
	O-F3	94		44	O-B3				
	O-F2	93		43	O-B2				
	O-F1	92		42	O-B1				
	O-F0	91		41	O-B0				
+E port (Output)	O-E7	90		40	O-A7	+A port (Output)			
	O-E6	89		39	O-A6				
	O-E5	88		38	O-A5				
	O-E4	87		37	O-A4				
	O-E3	86		36	O-A3				
	O-E2	85		35	O-A2				
	O-E1	84		34	O-A1				
	O-E0	83		33	O-A0				
Common minus pin for +E/+F output ports	N-E/F	82		32	N-A/B	Common minus pin for +A/+B output ports			
	N-E/F	81		31	N-A/B				
	N-E/F	80		30	N-A/B				
	N-E/F	79		29	N-A/B				
	N-E/F	78		28	N-A/B				
	N-E/F	77		27	N-A/B				
	N.C.	76		26	N.C.				
	N.C.	75		25	N.C.				
Common plus pin for +C/+D output ports	P-C/D	74		24	P-8/9	Common plus pin for +8/+9 output ports			
	P-C/D	73		23	P-8/9				
+D port (Output)	O-D7	72		22	O-97	+9 port (Output)			
	O-D6	71		21	O-96				
	O-D5	70		20	O-95				
	O-D4	69		19	O-94				
	O-D3	68	18	O-93					
	O-D2	67	17	O-92					
	O-D1	66	16	O-91					
	O-D0	65	15	O-90					
+C port (Output)	O-C7	64	14	O-87	+8 port (Output)				
	O-C6	63	13	O-86					
	O-C5	62	12	O-85					
	O-C4	61	11	O-84					
	O-C3	60	10	O-83					
	O-C2	59	9	O-82					
	O-C1	58	8	O-81					
	O-C0	57	7	O-80					
Common minus pin for +C/+D output ports	N-C/D	56	6	N-8/9	Common minus pin for +8/+9 output ports				
	N-C/D	55	5	N-8/9					
	N-C/D	54	4	N-8/9					
	N-C/D	53	3	N-8/9					
	N-C/D	52	2	N-8/9					
	N-C/D	51	1	N-8/9					

CNA									
Common minus pin for +0/+1 output ports	N-0/1	1		51	N-4/5	Common minus pin for +4/+5 output ports			
	N-0/1	2		52	N-4/5				
	N-0/1	3		53	N-4/5				
	N-0/1	4		54	N-4/5				
	N-0/1	5		55	N-4/5				
	N-0/1	6		56	N-4/5				
+0 port (Output)	O-00	7		57	O-40	+4 port (Output)			
	O-01	8		58	O-41				
	O-02	9		59	O-42				
	O-03	10		60	O-43				
	O-04	11		61	O-44				
	O-05	12		62	O-45				
	O-06	13		63	O-46				
	O-07	14		64	O-47				
+1 port (Output)	O-10	15		65	O-50	+5 port (Output)			
	O-11	16		66	O-51				
	O-12	17		67	O-52				
	O-13	18		68	O-53				
	O-14	19		69	O-54				
	O-15	20		70	O-55				
	O-16	21		71	O-56				
	O-17	22		72	O-57				
Common plus pin for +0/+1 output ports	P-0/1	23		73	P-4/5	Common plus pin for +4/+5 output ports			
	P-0/1	24		74	P-4/5				
	N.C.	25		75	N.C.				
	N.C.	26		76	N.C.				
Common minus pin for +2/+3 output ports	N-2/3	27		77	N-6/7	Common minus pin for +6/+7 output ports			
	N-2/3	28		78	N-6/7				
	N-2/3	29	79	N-6/7					
	N-2/3	30	80	N-6/7					
	N-2/3	31	81	N-6/7					
	N-2/3	32	82	N-6/7					
+2 Port (Output)	O-20	33	83	O-60	+6 port (Output)				
	O-21	34	84	O-61					
	O-22	35	85	O-62					
	O-23	36	86	O-63					
	O-24	37	87	O-64					
	O-25	38	88	O-65					
	O-26	39	89	O-66					
	O-27	40	90	O-67					
+3 Port (Output)	O-30	41	91	O-70	+7 port (Output)				
	O-31	42	92	O-71					
	O-32	43	93	O-72					
	O-33	44	94	O-73					
	O-34	45	95	O-74					
	O-35	46	96	O-75					
	O-36	47	97	O-76					
	O-37	48	98	O-77					
Common plus pin for +2/+3 output ports	P-2/3	49	99	P-6/7	Common plus pin for +6/+7 output ports				
	P-2/3	50	100	P-6/7					

* I-00 - I-17 can be used as interrupt signal.

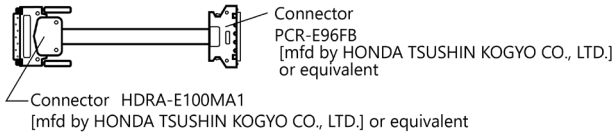
Signal name	Description
O-00 - O-F7	128 output signal pins. Connect these pins to the input signal pins of the external device.
P-0/1	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-2/3	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-4/5	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-6/7	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-8/9	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-A/B	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-C/D	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
P-E/F	Connect the positive side of the external power supply. These pins are common to 16 output signal pins.
N-0/1	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-2/3	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-4/5	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-6/7	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-8/9	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-A/B	Connect the negative side of the external power supply. These pins are common to 16 output signal pins. A current of 0.3 A is allowable per connector pin. Connect the required number of pins for the total current for the corresponding 16 output signals. All 6 pins must be connected when using all 16 outputs at the maximum rated output current of 100 mA.
N-C/D	Connect the negative side of the external power supply. These pins are common to 16 channels output signal. One pin permissible current of the connector is 0.3A. Please connect necessary number of pins for the corresponding total current of the output 16 channels. When 16 channels are used by the output full ratings (100mA per 1 channel), it is necessary to connect six all.
N-E/F	Connect the negative side of the external power supply. These pins are common to 16 channels output signal. One pin permissible current of the connector is 0.3A. Please connect necessary number of pins for the corresponding total current of the output 16 channels. When 16 channels are used by the output full ratings (100mA per 1 channel), it is necessary to connect six all.
N.C.	This pin is left unconnected.

CAUTION

To perform input/output using this product with the CONTEC device driver, specify logical ports and logical bits when calling each function. For details, refer to the "Relationships between API-TOOL Logical Ports/Bits and Connector Signal Pins" of Reference Manual.

Pin Assignments of Optional Connector PCB100/96PS

- Option Cable PCB100/96PS



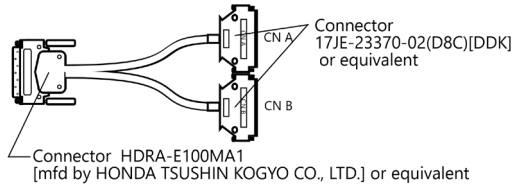
When connected to CNB of the product									
Common minus pin for +C/+D output ports	N-C/D	B01		A01	N-8/9	Common minus pin for +B/+9 output ports			
	N-C/D	B02		A02	N-8/9				
+C port (Output)	O-C0	B03		A03	O-80	+8 port (Output)			
	O-C1	B04		A04	O-81				
	O-C2	B05		A05	O-82				
	O-C3	B06		A06	O-83				
	O-C4	B07		A07	O-84				
	O-C5	B08		A08	O-85				
	O-C6	B09		A09	O-86				
	O-C7	B10		A10	O-87				
+D port (Output)	O-D0	B11		A11	O-90	+9 port (Output)			
	O-D1	B12		A12	O-91				
	O-D2	B13		A13	O-92				
	O-D3	B14		A14	O-93				
	O-D4	B15		A15	O-94				
	O-D5	B16		A16	O-95				
	O-D6	B17		A17	O-96				
	O-D7	B18		A18	O-97				
Common plus pin for +C/+D output ports	P-C/D	B19		A19	P-8/9	Common plus pin for +8/+9 output ports			
	P-C/D	B20		A20	P-8/9				
Unconnected	N.C.	B21		A21	N.C.	Unconnected			
	N.C.	B22		A22	N.C.				
	N.C.	B23		A23	N.C.				
	N.C.	B24		A24	N.C.				
	N.C.	B25		A25	N.C.				
	N.C.	B26		A26	N.C.				
	N.C.	B27		A27	N.C.				
	N.C.	B28		A28	N.C.				
Common minus pin for +E/+F output ports	N-E/F	B29		A29	N-A/B	Common minus pin for +A/+B output ports			
	N-E/F	B30		A30	N-A/B				
+E port (Output)	O-E0	B31		A31	O-A0	+A port (Output)			
	O-E1	B32		A32	O-A1				
	O-E2	B33		A33	O-A2				
	O-E3	B34		A34	O-A3				
	O-E4	B35		A35	O-A4				
	O-E5	B36		A36	O-A5				
	O-E6	B37		A37	O-A6				
	O-E7	B38		A38	O-A7				
+F port (Output)	O-F0	B39		A39	O-B0	+B port (Output)			
	O-F1	B40		A40	O-B1				
	O-F2	B41		A41	O-B2				
	O-F3	B42		A42	O-B3				
	O-F4	B43		A43	O-B4				
	O-F5	B44		A44	O-B5				
	O-F6	B45		A45	O-B6				
	O-F7	B46		A46	O-B7				
Common plus pin for +E/+F output ports	P-E/F	B47		A47	P-A/B	Common plus pin for +A/+B output ports			
	P-E/F	B48		A48	P-A/B				

When connected to CNA of the product									
Common minus pin for +4/+5 output ports	N-4/5	B01		A01	N-0/1	Common minus pin for +0/+1 output ports			
	N-4/5	B02		A02	N-0/1				
+4 port (Output)	O-40	B03		A03	O-00	+0 port (Output)			
	O-41	B04		A04	O-01				
	O-42	B05		A05	O-02				
	O-43	B06		A06	O-03				
	O-44	B07		A07	O-04				
	O-45	B08		A08	O-05				
	O-46	B09		A09	O-06				
	O-47	B10		A10	O-07				
+5 port (Output)	O-50	B11		A11	O-10	+1 port (Output)			
	O-51	B12		A12	O-11				
	O-52	B13		A13	O-12				
	O-53	B14		A14	O-13				
	O-54	B15		A15	O-14				
	O-55	B16		A16	O-15				
	O-56	B17		A17	O-16				
	O-57	B18		A18	O-17				
Common plus pin for +4/+5 output ports	P-4/5	B19		A19	P-0/1	Common plus pin for +0/+1 output ports			
	P-4/5	B20		A20	P-0/1				
Unconnected	N.C.	B21		A21	N.C.	Unconnected			
	N.C.	B22		A22	N.C.				
	N.C.	B23		A23	N.C.				
	N.C.	B24		A24	N.C.				
	N.C.	B25		A25	N.C.				
	N.C.	B26		A26	N.C.				
	N.C.	B27		A27	N.C.				
	N.C.	B28		A28	N.C.				
Common minus pin for +6/+7 output ports	N-6/7	B29		A29	N-2/3	Common minus pin for +2/+3 output ports			
	N-6/7	B30		A30	N-2/3				
+6 port (Output)	O-60	B31		A31	O-20	+2 port (Output)			
	O-61	B32		A32	O-21				
	O-62	B33		A33	O-22				
	O-63	B34		A34	O-23				
	O-64	B35		A35	O-24				
	O-65	B36		A36	O-25				
	O-66	B37		A37	O-26				
	O-67	B38		A38	O-27				
+7 port (Output)	O-70	B39		A39	O-30	+3 port (Output)			
	O-71	B40		A40	O-31				
	O-72	B41		A41	O-32				
	O-73	B42		A42	O-33				
	O-74	B43		A43	O-34				
	O-75	B44		A44	O-35				
	O-76	B45		A45	O-36				
	O-77	B46		A46	O-37				
Common plus pin for +6/+7 output ports	P-6/7	B47		A47	P-2/3	Common plus pin for +2/+3 output ports			
	P-6/7	B48		A48	P-2/3				

The numbers in square brackets [] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.

Pin Assignments of Optional Connector PCB100WS

- Option Cable PCB100WS



CNA of PCB100WS connecting to the board CNB									
	N.C.	19							
Common plus pin for +8/+9 output ports	P-8/9	18		37	P-A/B			Common plus pin for +A/+B output ports	
+9 port (Output)	O-97	17		36	O-B7	+B port (Output)			
	O-96	16		35	O-B6				
	O-95	15		34	O-B5				
	O-94	14		33	O-B4				
	O-93	13		32	O-B3				
	O-92	12		31	O-B2				
	O-91	11		30	O-B1				
	O-90	10		29	O-B0				
+8 port (Output)	O-87	9		28	O-A7	+A port (Output)			
	O-86	8		27	O-A6				
	O-85	7		26	O-A5				
	O-84	6		25	O-A4				
	O-83	5		24	O-A3				
	O-82	4		23	O-A2				
	O-81	3		22	O-A1				
	O-80	2		21	O-A0				
Common minus pin for +8/+9 output ports	N-8/9	1		20	N-A/B	Common minus pin for +A/+B output ports			

CNA of PCB100WS connecting to the board CNA									
	N.C.	19							
Common plus pin for +0/+1 output ports	P-0/1	18		37	P-2/3			Common plus pin for +2/+3 output ports	
+1 port (Output)	O-17	17		36	O-37	+3 port (Output)			
	O-16	16		35	O-36				
	O-15	15		34	O-35				
	O-14	14		33	O-34				
	O-13	13		32	O-33				
	O-12	12		31	O-32				
	O-11	11		30	O-31				
	O-10	10		29	O-30				
+0 port (Output)	O-07	9		28	O-27	+2 port (Output)			
	O-06	8		27	O-26				
	O-05	7		26	O-25				
	O-04	6		25	O-24				
	O-03	5		24	O-23				
	O-02	4		23	O-22				
	O-01	3		22	O-21				
	O-00	2		21	O-20				
Common minus pin for +0/+1 output ports	N-0/1	1		20	N-2/3	Common minus pin for +2/+3 output ports			

CNB of PCB100WS connecting to the board CNB									
	N.C.	19							
Common plus pin for +C/+D output ports	P-C/D	18		37	P-E/F			Common plus pin for +E/+F output ports	
+D port (Output)	O-D7	17		36	O-F7	+F port (Output)			
	O-D6	16		35	O-F6				
	O-D5	15		34	O-F5				
	O-D4	14		33	O-F4				
	O-D3	13		32	O-F3				
	O-D2	12		31	O-F2				
	O-D1	11		30	O-F1				
	O-D0	10		29	O-F0				
+C port (Output)	O-C7	9		28	O-E7	+E port (Output)			
	O-C6	8		27	O-E6				
	O-C5	7		26	O-E5				
	O-C4	6		25	O-E4				
	O-C3	5		24	O-E3				
	O-C2	4		23	O-E2				
	O-C1	3		22	O-E1				
	O-C0	2		21	O-E0				
Common minus pin for +C/+D output ports	N-C/D	1		20	N-E/F	Common minus pin for +E/+F output ports			

CNB of PCB100WS connecting to the board CNA									
	N.C.	19							
Common plus pin for +4/+5 output ports	P-4/5	18		37	P-6/7			Common plus pin for +6/+7 output ports	
+5 port (Output)	O-57	17		36	O-77	+7 port (Output)			
	O-56	16		35	O-76				
	O-55	15		34	O-75				
	O-54	14		33	O-74				
	O-53	13		32	O-73				
	O-52	12		31	O-72				
	O-51	11		30	O-71				
	O-50	10		29	O-70				
+4 port (Output)	O-47	9		28	O-67	+6 port (Output)			
	O-46	8		27	O-66				
	O-45	7		26	O-65				
	O-44	6		25	O-64				
	O-43	5		24	O-63				
	O-42	4		23	O-62				
	O-41	3		22	O-61				
	O-40	2		21	O-60				
Common minus pin for +4/+5 output ports	N-4/5	1		20	N-6/7	Common minus pin for +6/+7 output ports			