Counters / Motor Controllers

COUNTER
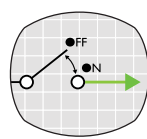
Application	Counting ON/OFF of contact points and switches
Description	Input of ON/OFF signals
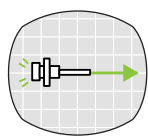
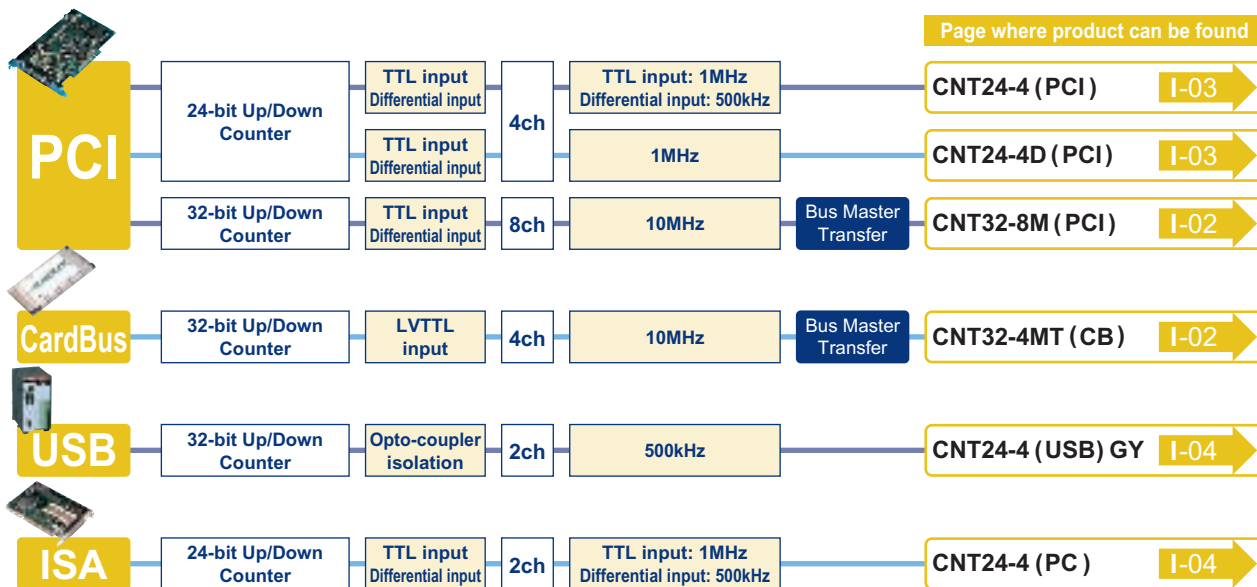| Application	Measurement of individual sensors
Description	Input of pulse signal

These boards communicate pulse train input and pulse number count functions to the PC.
They calculate addition and/or subtraction of count values onboard and read out current count values when needed.
They can connect to incremental rotary encodes, linear gauges, pulse-output type flowmeters or power meters.

Product Lineup

You can choose from a variety of interface boards according to your desired bus, I/O points and I/O type.

Page where product can be found

PCI — 24-bit Up/Down Counter — TTL input Differential input — 4ch — TTL input: 1MHz Differential input: 500kHz — **CNT24-4 (PCI)** I-03

PCI — 24-bit Up/Down Counter — TTL input Differential input — 4ch — 1MHz — **CNT24-4D (PCI)** I-03

PCI — 32-bit Up/Down Counter — TTL input Differential input — 8ch — 10MHz — Bus Master Transfer — **CNT32-8M (PCI)** I-02

CardBus — 32-bit Up/Down Counter — LVTTL input — 4ch — 10MHz — Bus Master Transfer — **CNT32-4MT (CB)** I-02

USB — 32-bit Up/Down Counter — Opto-coupler isolation — 2ch — 500kHz — **CNT24-4 (USB) GY** I-04

ISA — 24-bit Up/Down Counter — TTL input Differential input — 2ch — TTL input: 1MHz Differential input: 500kHz — **CNT24-4 (PC)** I-04

Pictograms

Bus Specifications

PCI
The product is compliant with PCI standard and can be used in computers equipped with PCI bus expansion slot.

USB 2.0
The product is compliant with USB standard and can be used with laptop computers equipped with USB2.0/1.1 ports. It also supports USB2.0 high-speed mode(480Mbps).

Card Bus
The product supports CardBus which is a 32-bit bus compliant with PC card standard.

Support software

Windows Driver
API-TOOLs for Windows is provided. License-free drivers (both development and runtime) that provide commands to add-on boards or cards in Windows using the standard Win32API function (DLL).

Linux Diver
API-TOOLs for Linux is provided. License-free drivers (both development and runtime) that provide commands to add-on boards or cards using module-style device drivers and the shared library

LabVIEW
VI-DAQ, VI Library for use with National Instruments' LabVIEW can be downloaded from our Web site. With its function and form similar to that of "Data Acquisition VI" of LabVIEW, VI-DAQ allows easy operation of devices without requiring complicated set-up.

Supported Connectors

96-pin Half Pitc   **37-pin D-SUB**

Indicates the number of pins and shapes of connectors used for external connection. The supported cables and accessories will vary depending on the number of pins and the shape of connectors.

We provide a wide variety of cables and accessories to suit your needs.

Cables equipped with connectors on both ends Accessories (Terminal blocks, etc.) **O-13**

Cables equipped with a connector on one end Connector set **O-15**

Number of Channels Connectors

Counter XXch   Maximum number of channels of pulse signals that can be input

Points

Differential Input
A level input circuit in which differential receiver is used as input terminal. While it is not insulated from external circuit, it supports high-speed pulse input. Also noise-resistant, it allows for long-distance transfer.

Isolated Input
A current input circuit in which an opto-coupler (cathode side) is used as the input terminal. Isolated from external circuits, it can prevent electric disturbance.

TTL Input
A level-input circuit in which a TTL-IC (base) is used as the input terminal. While not Isolated from external circuits, it enables high-speed pulse input.

Digital Filter
Delays the count processing by the specified length of time. By preventing incorrect counting induced by noise such as chattering, it ensures precise operation.

Disconnection Detection
During differential input, an error alarm is issued upon detection of a signal wire disconnection. (Status, interrupt, external output)

Surge Protection
The input interface is equipped with a Zener diode which prevents damage and malfunction induced by voltage surges and incoming current.

Counters

PCI

| 96-pin Half Pitch | Counter 8ch | Differential Input | TTL Input | Digital Filter | Disconnection Detection | Bus Master | CE |

Windows Driver

Bus Master Transfer
High Speed 8-channel 32-bit Up/Down Counter
CNT32-8M(PCI)

- 8-channel, 32-bit up/down counter
- Capable of counting two-phase signals from devices like rotary encoders or linear gauges
- Disconnection can be detected at the time of differential input
- When using the bus master transfer feature, data between the board and PC can be transferred at a speed of 80MB/sec (max.133MB/sec) with no additional load on the computer.
- Synchronous Control Connector to enable the synchronous operation of a number of boards (regardless of type).

Card Bus

| 68-pin 0.8mm Pitch | Counter 4ch | TTL Input | Digital Filter | Bus Master |

Windows Driver

High Speed 4 channel 32-Bit Up/Down Counter
CNT32-4MT(CB)

NEW

- 4-channel 32-bit up/down counter, LVTTL input supported
- Capable of counting two-phase signals from devices like rotary encoders or linear gauges
- High-speed data transfer achieved by using the bus master transfer feature
- Can be converted into differential input interface by using differential/TTL input terminal (CTP-4D) and a connecting cable (CNT-68M/50M) both of which are sold separately

Pb Free

* This card cannot be used with another card requiring external connections when used on a PC with 2 TYPEII PC card slots. For simultaneous use, the other card must be a PC card (excluding memory card) that does not require an external connector.

Differential / TTL Input Terminal
CTP-4D

Optional Cable
CNT-68M/50M

I-02

Model	CNT32-8M(PCI)	CNT32-4MT(CB)	
Number of Channels	8	4	
Counting System	32-bit Up/Down Counter (two-phase/single-phase/single-phase with Gate Control)		
Input Signals	Phase A/UP: 1 point × 8ch Phase B/DOWN: 1 point × 8ch Phase Z/CLR: 1 point × 8ch General-purpose input: 1 point × 8ch	Phase A/UP: 1 point × 4ch Phase B/DOWN: 1 point × 4ch Phase Z/CLR: 1 point × 4ch	
Response Frequency (Max.)	Differential input: 10MHz (duty: 50%) TTL-level input: 10MHz (duty: 50%)	10MHz (duty: 50%)	
Timer	1~6553msec (selectable in 1msec intervals)		
Max. Count	32-bit binary data		
Input Specifications	TTL-level: 1 TTL-level load Differential: input voltage range ±7V	LVTTL-level input	
Interrupts	1 interrupt (factors: count mathch, count error, sampling factors, SCC error, carry/borrow, timer)	1 interrupt (factors: count mathch, count error, sampling factors, carry/borrow, timer)	
I/O Address	Any 32-byte boundary		
Additional Function	Filter, Counter coincidence pulse output, Test pulse output and Disconnection alarm output	Filter, Counter coincidence pulse output and Test pulse output	
Power Consumption (Max.)	5VDC, 1A	3.3VDC, 300mA	
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) × 106.68(H)	PC Card Standard CardBus / TYPE II	
Connector	PCR-E96LMD[HONDA Tsushin Kogyo] PS-10PE-D4L1-B1[JAE] or equivalent × 2	-	
Options	Software	-	
	Accessories	EPD-96*1, DTP-64*1	CTP-4D*2, EPD-50A*2
	Cables / Connectors	PCA96P-1.5, PCB96P-1.5, PCA96PS-0.5P/1.5P, PCB96PS-0.5P/1.5P, CN5-H96F	CNT-68M/50M, PCA68PS-0.5P/1.5P

Note:　*1: Requires use of optional cable PCB96P or PCB96PS.
*2: Requires use of optional cable CNT-68M/50M.

Counters

PCI | **37-pin D-SUB** | **Counter 4ch** | **Isolated Input** | **TTL Input** | **Digital Filter** | CE

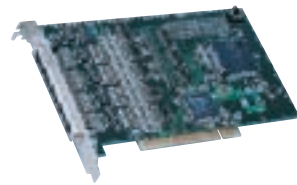**Windows Driver** | **Linux Diver** | **LabVIEW**

4 Channel 24-bit Up/Down Counter
CNT24-4(PCI)

- 4 channel, 24-bit up/down counter
- Able to count two-phase signals from devices such as rotary encoders or linear gauges (A maximum of 4 encoders can be connected)
- Equipped with a programmable timer

PCI | **96-pin Half Pitch** | **Counter 4ch** | **Differential Input** | **TTL Input** | **Digital Filter** | **Surge Protection** | CE

Windows Driver | **Linux Diver** | **LabVIEW**

4 Channel 24-bit Differential Up/Down Counter
CNT24-4D(PCI)

- 4 channel, 24-bit up/down counter
- Able to count two-phase signals from devices such as rotary encoders or linear gauges (A maximum of 4 encoders can be connected)
- Equipped with a programmable timer
- Differential input area is equipped with a surge protection device

I-03

Model	CNT24-4(PCI)	CNT24-4D(PCI)	
Number of Channels	4		
Counting System	24-bit Up/Down Counter (two-phase/single-phase/single-phase with Gate Control)		
Input Signals	Phase A/UP: 1 point × 4ch, Phase B/DOWN: 1 point × 4ch, Phase Z/CLR: 1 point × 4ch, General-purpose input: 1 point × 4ch		
Response Frequency (Max.)	TTL-level input: 1MHz (duty: 50%) Opto-isolated input: 500kHz (duty: 50%)	Differential input: 1MHz (duty: 50%) TTL-level input: 1MHz (duty: 50%)	
Timer	1msec~200sec		
Max. Count	24-bit binary data		
Input Specifications	TTL-level: 1 TTL-level load Opto-isolated: DC5V~12VImpedance: 220Ω	TTL-level: 1 TTL-level load Differential: input voltage range ± 7V	
Interrupts	One point generated when the count of each channel matches or the timer runs out of time		
I/O Address	4 port occupation	Any 32-byte boundary	
Additional Function	Filter function and Counter coincidence pulse output function		
Power Consumption (Max.)	5VDC 400mA	5VDC 500mA	
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) × 106.68(H)		
Connector	Opto-isolated input: DCLC-J37SAF-20L9 [JAE] or equivalent TTL-level input: PS-30PE-D4TIPNI [JAE] or equivalent	PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent	
Options	Software	-		
	Accessories	DTP-3(PC), DTP-4(PC), EPD-37A*1, EPD-37*1	DTP-3(PC)*2, DTP-4(PC)*2, EPD-37A*2, EPD-37*2, EPD-96*3, DTP-64(PC)*3, CCB-96*3	
	Cables / Connectors	PCA37P, PCB37P, PCA37PS, PCB37PS, DT/O, DT/B2, CN5-D37M	PCA96P, PCB96P, PCB96W, PCA96PS, PCB96PS, PCB96WS, CN5-D37M	

*1: Requires use of optional cable PCB37P or PCB37PS.
*2: Requires use of optional cable PCB96W or PCB96WS.
*3: Requires use of optional cable PCB96P or PCB96PS.

Note:

Counters

USB 2.0

| Counter 2 | Isolated Input | Digital Filter | CE |
| Windows Driver | LabVIEW |

Opto-Isolated Counter Module (AC Adapter & USB Cable included)
CNT24-2(USB)GY

● Supporting a variety of counter modes
● Counter coincidence pulse output (signal frequency can be set 0~104.5ms)
● Digital filter (0.1~1056.1 s. variable sampling range frequency)
● 2 Screwless connectors for easy wiring - no special tools needed
● Additional channels through use of extension modules (Max. 3 sets)
● 35mm DIN rail mountable
● Sample development and utility debugging software included

Model	CNT24-2(USB)GY	
Number of Channels	2	
Counting System	24-bit Up/Down Counter (two-phase/single-phase/single-phase with Gate Control)	
Input type	Opto-Isolated (for high sink current output)	
Input Signals	Phase A/UP: 1 point × 2ch Phase B/DOWN: 1 point × 2ch Phase Z/CLR: 1 point × 2ch General-purpose input: 1 point × 2ch	
Response Frequency (Max.)	500kHz, duty: 50%	
Connector	FK-MC0.5/9-ST-2.5 [PHOENIX CONTACT]	
USB speed	12Mbps (Full Speed) 480Mbps (High Speed)	
Additional Function	Filter, Counter coincidence pulse output	
Power Consumption (Max.)	5VDC 450mA *1	
Dimensions (mm)	50.4(W) × 64.7(D) × 94.0(H)	
Weight (main unit)	100g	
Included AC Adapter	AC90~264V, DC5.0V ± 5%, 2.0A(Max.) Cable Length: approx. 1.4m	
Included Cable	USB cable 1.8m	
Options	Software	-
	Applicable Modules *2	CNT24-2(FIT)GY
	Applicable Power Supplies *2	POA-AD22, POW-AD13GY, POW-AD22GY, POW-DD10GY, POW-DD43GY

Note:
*1: Since current consumption may exceed 500mA when using an extension module, please use a attached AC adapter or a optional power supply.
*2: Please refer to P-04 or visit our web site for the details of Applicable Modules, Power supplies, Adapters.

ISA

Model

4 Channels 24-bit Up/Down Counter
CNT24-4(PC)

SPECIFICATIONS

Number of Channels	4
Counting System	24-bit Up/Down Counter (two-phase/single-phase/single-phase with Gate Control)
Input Signals	Phase A/UP: 1 point × 4ch Phase B/DOWN: 1 point × 4ch Phase Z/CLR: 1 point × 4ch General-purpose input: 1 point × 4ch
Response Frequency (Max.)	TTL-level input: 1MHz (duty: 50%) Opto-isolated input: 500kHz (duty: 50%)
Timer	1msec~200sec
Max. Count	24-bit binary data
Input Specifications	TTL-level: 1 TTL-level load Opto-isolated: 220Ω
Interrupts	Preset value of each channel matches or TimeUp value can be set as one of IRQ3~7, 9~12, 14 or 15
I/O address / Addition Function	Any 2-byte boundary / Filter funtion
Power Consumption (Max.)	5VDC 300mA
Bus / Dimensions (mm)	AT Bus / 163.0(L) × 122.0(H)
Connector	Opto-isolated input: 37-pin D-SUB female connector TTL-level input: 30-pin header male connector
Option	Software	API-PAC(W32)
	Accessories	DTP-3(PC), DTP-4(PC), EPD-37A*1, EPD-37*1
	Cables / Connectors	PCA37P, PCB37P, PCA37PS, PCB37PS
CE marking	○

*1: Requires use of optional cable PCB37P or PCB37PS.

Counters / Motor Controllers

I

MOTOR CONTROLLERS
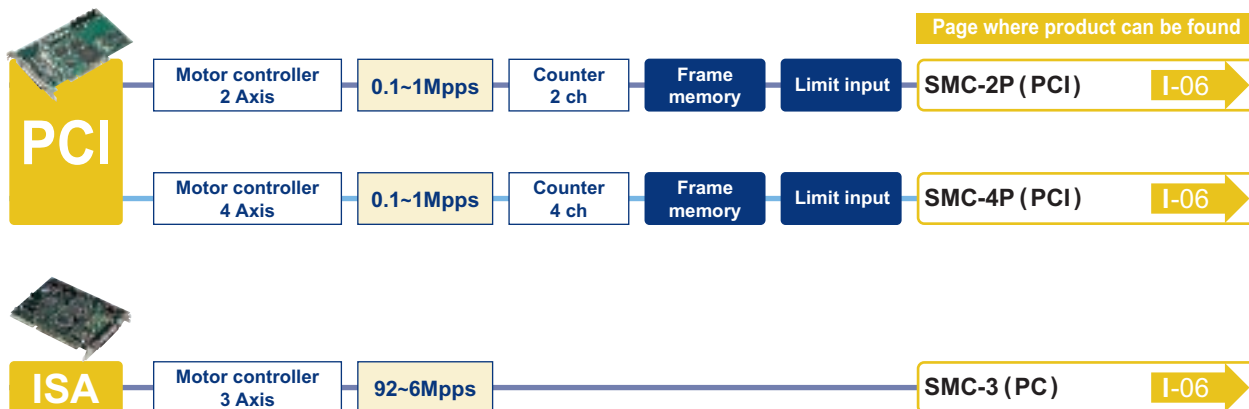

Application — Motor control

Description — Pulse signal output

Enables PC controlled output of pulse train according to a specified pulse number and frequency.

Can automatically output control pulse which corresponds to operation parameters such as target position, speed and acceleration / deceleration rate. Limit input functions [required for positioning control] are also provided. For use with pulse-input type stepping motors or servo motors..

Product Lineup

You can choose from a variety of interface boards according to your desired bus, I/O points and I/O type.

Page where product can be found

	Motor controller 2 Axis	0.1~1Mpps	Counter 2 ch	Frame memory	Limit input	SMC-2P (PCI)	I-06
PCI	Motor controller 4 Axis	0.1~1Mpps	Counter 4 ch	Frame memory	Limit input	SMC-4P (PCI)	I-06
ISA	Motor controller 3 Axis	92~6Mpps				SMC-3 (PC)	I-06

Pictograms

Bus Specifications

PCI

The product is compliant with PCI standard and can be used on PC equipped with PCI bus expansion slot.

Support software

Windows Driver

API-TOOLs for Windows is provided. License-free drivers (both development and runtime) that provide commands to add-on boards or cards in Windows using the standard Win32API function (DLL).

Supported Connectors

96-pin Half Pitc

Indicates the number of pins and shapes of connectors used for external connection.
The supported cables and accessories will vary depending on the number of pins and the shape of connectors.

We provide a wide variety of cables and accessories to suit your needs.

Cables equipped with connectors on both ends
Accessories (Terminal blocks, etc.) **O-16**

Cables equipped with a connector on one end
Connector set **O-16**

Number of Channels Connectors

Motor Controller XXch — Number of Channels

Counter XXch — Maximum number of input channels for pulse signals.

Points

Frame Data Store — Can store a maximum of 1,000 frames [1 frame gathering information necessary for single positioning such as speed, acceleration/deceleration rate and target position].

Limit Switch Input — Detects the stop point, deceleration point and origin point of the motor for high-level positioning control.

Motor Controllers

PCI | 96-pin Half Pitch | Motor Controller 2ch | Counter 2ch | Frame Data Store | Limit Switch Input | CE

Windows Diver

High Speed 2 Axes Motor Controller
SMC-2P(PCI)

● Stepping and servo motors are easily controlled in familiar Windows environments
● Able to store 1000 frames - each frame carrying required information for single positioning sequence (i.e. speed, acceleration/deceleration rate, target location)
● Able to control multiple axis (max. 32) in synchronization
● Supporting linear interpolation control on several axis

PCI | 96-pin Half Pitch | Motor Controller 4ch | Counter 4ch | Frame Data Store | Limit Switch Input | CE

Windows Diver

High Speed 4 Axes Motor Controller
SMC-4P(PCI)

● Stepping and servo motors are easily controlled in familiar Windows environments
● Able to store 1000 frames - each frame carrying required information for single positioning sequence (i.e. speed, acceleration/deceleration rate, target location)
● Able to control multiple axis (max. 64) in synchronization
● Supporting linear interpolation control on several axis

ISA | 37-pin D-SUB | Motor Controller 4ch | CE
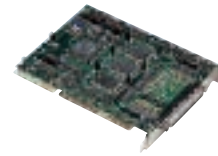
3 Axes Motor Controller
SMC-3(PC)

Model	SMC-2P(PCI)	SMC-4P(PCI)	SMC-3(PC)	
Number of Channels	2	4	3	
Pulse output — Signal Specifications	2-pulse (CW/CCW) or Common-pulse (Pulse/Direction)			
Pulse output — Output type	Open collector (software selectable positive/negative logic)			
Pulse output — Pulse Rate	0.1~1Mpps		92~6Mpps	
Pulse output — Rating	35VDC 100mA		-	
Encoder input — Signal Form	Single-phase (UP/DOWN/Z), Two-phase (A/B/Z)		-	
Encoder input — Signal type	High-speed opto-isolated		-	
Encoder input — Response Frequency	1MHz		-	
Encoder input — Resistance	A,B: 220Ω / Z: 510Ω		-	
Limit Signal — Signals	3 signals/ch (ORG, +LIM, -LIM)		4 signals/ch (ORG, +LIM, -LIM, Slowdown)	
Limit Signal — Signal type	Opto-isolated input (12~24VDC)			
Limit Signal — Input Resistance	3kΩ		3.3kΩ	
General-purpose input — Signals	7 signals/ch		2 signals/MPG (each MPG emergency stop option is jumper selectable)	
General-purpose input — Signal type	Opto-isolated (12~24VDC)		Opto-isolated (12~24VDC)	
General-purpose input — Resistance	IN1, IN3~IN7: 3kΩ; IN2: 1.8kΩ		3.3kΩ	
General-purpose output — Signals	3 signals/ch		2 signals/ch	
General-purpose output — Signal type	Open collector		Opto-isolated Open collector	
General-purpose output — Rating	35VDC 100mA		35VDC 200mA	
Controller Chip	PCL5014 [NPM]		MPG1020 × 3 [MYCOM]	
Interrupts	-		Pulse output stop or stop error (Can use 4 of IRQ3~7, 9~12, 14 or 15)	
I/O Address	Any 16-byte boundary		4 port occupation	
Power Consumption (Max.)	5VDC 800mA	5VDC 900mA	5VDC 600mA	
Bus / Dimensions (mm)	PCI (32bit, 33MHz, 5V) / 176.41(L) × 106.68(H)		ISA / 163.0(L) × 122.0(H)	
Connector	PCR-E96LMD [HONDA Tsushin Kogyo] or equivalent		37-pin D-type female connector	
Options — Software	-		API-PAC(W32)	
Options — Accessories	CCB-SMC1*1, EPD-96		DTP-3(PC), DTP-4(PC), EPD-37A*2, EPD-37*2	
Options — Cables / Connectors	PCA96P, PCA96PS, PCB96P, PCB96PS, CN5-D96M		PCA37P, PCB37P, PCA37PS, PCB37PS	

Note:
*1: Requires use of optional cable PCB96P or PCB96PS.
*2: Requires use of optional cable PCB37P or PCB37PS.