Panasonic

PROGRAMMABLE CONTROLLER

FP2 High-speed Counter Unit
FP2 Pulse I/O Unit
Manual

ARCT1F323E-4

2013.7 | panasonic.net/id/pidsx/global

Easy positioning control with a single FP2 pulse I/O unit

The FP2 Pulse I/O Unit is equipped with a pulse output function. Output pulses can be fed back to the unit, allowing easy positioning control with a single unit.

Four 0.8 A outputs provided

1.1.2 Unit Product Numbers

Name	Specifications	Built−in functions	Parts No.
FP2 High−speed Counter Unit (NPN output)	Input: 24 VDC + common Output: NPN 5 to 24 VDC (0.1 A 12 points/0.8 A 4 points)	8 interrupt inputs 4−channel high−speed counter 8 comparison outputs	FP2−HSCT
FP2 High−speed Counter Unit (PNP output)	Input: 24 VDC − common Output: PNP 5 to 24 VDC (0.1 A 12 points/0.8 A 4 points)		FP2−HSCP
FP2 Pulse I/O Unit (NPN output)	Input: 24 VDC + common Output: NPN 5 to 24 VDC (0.1 A 12 points/0.8 A 4 points)	8 interrupt inputs 4−channel high−speed counter 8 comparison outputs 4 pulse output channels 4 PWM output channels	FP2−PXYT
FP2 Pulse I/O Unit (PNP output)	Input: 24 VDC − common Output: PNP 5 to 24 VDC (0.1 A 12 points/0.8 A 4 points)		FP2−PXYP

Note: The unit comes with one 40−pin Wire−pressed terminal type connector.

Maintenance parts

Name	Contents	Product No.
Wire−pressed terminal type connector set	two pieces (40−pin, with semi−cover, AWG22, 24)	AFP2801

☞ Note

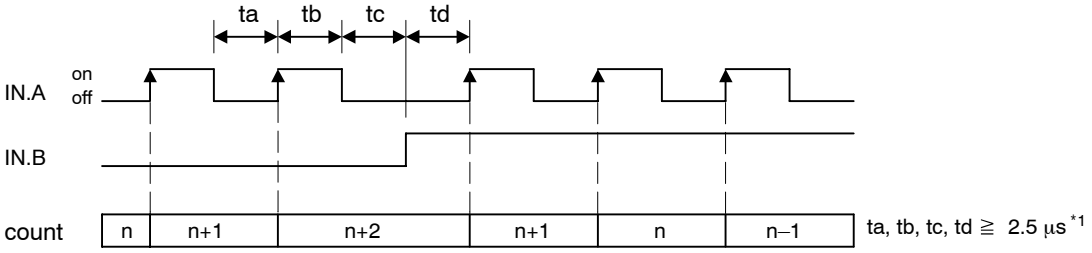
When using the FP2 High−Speed Counter/Pulse I/O Unit, the FP2 CPU unit used should be Ver. 1.09 or a subsequent version.

1.2.4 Counter Function

The FP2 High−speed Counter Unit and FP2 Pulse I/O Unit are equipped with four counter channels, and counting is carried out in the three input modes described below. The input modes can be set separately for each of the channels.

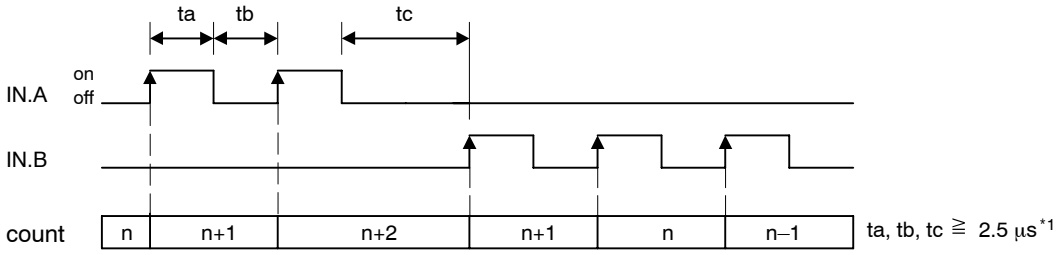
Direction control

The count value is incremented or decremented based on the pulse train and the direction signal.



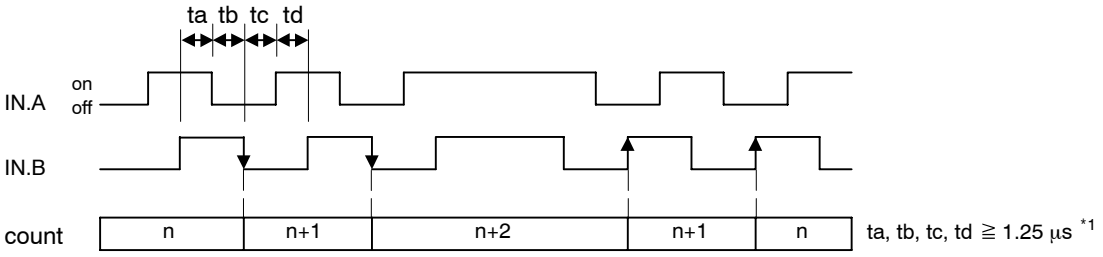
Individual input

The count value is incremented or decremented based on the CW and CCW input signals.



Phase different

The count value is incremented or decremented based on the phase differential input of the encoder or another device.



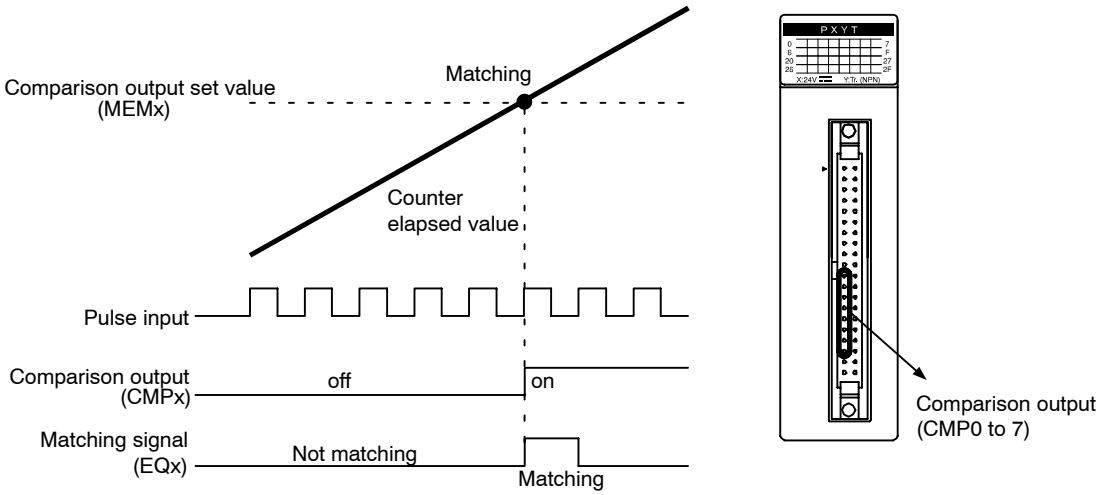
*1: This is the value when “No setting” is set for the input time constant function.

1.2.5 Comparison Output Function

The FP2 High−speed Counter Unit and FP2 Pulse I/O Unit are equipped with eight comparison outputs (CMP0 to CMP7).

The comparison outputs are output as a result of the counter elapsed value and the comparison output set value being compared.
The comparison output set values are specified in the shared memory (MEM0 to MEM7).

Counter elapsed value < Comparison output set value → Comparison output: off
Counter elapsed value ≧ Comparison output set value → Comparison output: on



* The on/off of the comparison output can also be specified to correspond to reversed operations. EQx is a signal used for internal processing, and is not output to an external device.

13.1 Table of Performance Specifications

I/O specifications

Common specifications

Item	FP2 High–speed Counter Unit		FP2 Pulse I/O Unit	
	NPN output	PNP output	NPN output	PNP output
Part No.	FP2–HSCT	FP2–HSCP	FP2–PXYT	FP2–PXYP
No. of dedicated inputs/ outputs	32 inputs, 32 outputs (32SX, 32SY)			
Internal current consumption	450 mA or less (at 5 VDC)		500 mA or less (at 5 VDC)	
Operation display	32–point LED display (lighted when on)			
External connections	Connector connections (One 40P long lever type conforming to MIL standards used)			
Weight	Approx. 110 g/3.9 oz		Approx. 130 g/4.6 oz	

Input specifications

Item			FP2 High–speed Counter Unit		FP2 Pulse I/O Unit	
			NPN output	PNP output	NPN output	PNP output
Part No.			FP2–HSCT	FP2–HSCP	FP2–PXYT	FP2–PXYP
Input	Insulation method		Photocoupler insulation			
	Rated input voltage		24 VDC			
	Rated input current		Approx. 7.5 mA (when using 24 VDC)			
	Input impedance		Approx. 3.2 kΩ			
	Usage voltage range		20.4 to 26.4 VDC			
	Min. on voltage/ min. on current		19.2 VDC / 6 mA			
	Max. off voltage/ max. off current		5.0 VDC / 1.5 mA			
	Response time *1	off → on	1 μs or less			
		on → off	2 μs or less			
	Input time constant setting		None, 4 μs, 8 μs, 16 μs, 32 μs (set in 2–input units)			
	Common method		16 points/common			
			+ common	– common	+ common	– common
Counter	No. of counter channels		4 channels			
	Calculation range		32–bit with sign (–2,147,483,648 to +2,147,483,647)			
	Max. calculation speed *1 *2		200 kHz			
	Input modes		3 modes (direction control, individual input, phase input)			
	Min. input pulse width *1		2.5 μs			
	Other		8 comparison outputs, multiplier function (1, 2, 4)			
Interrupt	No. of interrupt points *3		None, 1/unit, 8/unit (set with mode setting switches)			
	Interrupt processing delays		160 μs or less (when using FP2 CPU unit) 50 μs or less (when using FP2SH CPU unit)			

*1: This value is effective when the input time constant (filter) setting is set to “No setting”.

*2: If the quadrupling function is used for counting with phase input, the maximum calculation speed will be 800 kHz.

*3: The number of interrupt points is set using the mode setting switches on the side of the unit. If interrupts are used at a setting of one per unit, the program for interrupts from the external input terminal B1 (X8) or the program for interrupts from comparison 0 (one from among INT16 to INT23) is booted.

Output specifications

Item			FP2 High–speed Counter Unit		FP2 Pulse I/O Unit	
			NPN output	PNP output	NPN output	PNP output
Part No.			FP2–HSCT	FP2–HSCP	FP2–PXYT	FP2–PXYP
Output unit specifications	Insulation method		Photocoupler insulation			
	Rated load voltage		5 to 24 VDC			
	Rated load voltage range		4.75 to 26.4 VDC			
	Max. load current		0.1 A (A11 to A18, B11 to B14 pins), 0.8 A (B15 to B18 pins)			
	Leakage current when off		1 μA or less			
	Max. voltage drop when on		0.5 V or less			
	Response time	off → on	1 μs or less			
		on → off	1 μs or less	5 μs or less	1 μs or less	5 μs or less
	Surge killer		Zener diode			
	Common method		16 points/common			
	External power supply	Voltage	20.4 to 26.4 VDC			
		Current (at 24 V DC)	90 mA or less	200 mA or less	90 mA or less	200 mA or less
Counter	Comparison output		8 points (A11 to A18 pins)			
Pulse output	Channels		—		4 channels (B11 to B18 pins)	
	Max. output frequency *1				100 kHz	
	Output modes				2 modes (direction control, individual output)	
PWM output	No. of output points				4 channels (B15 to B18 pins)	
	Max. load current				0.8 A	
	Cycle *1				1 Hz to 30 kHz	
	Duty *1				0 to 100% (unit: 1%)	

*1: At maximum load current and resistance load. There may be distortion in the output waveform, depending on the load current and type of load.

Function specifications

Function	Item	FP2 High−speed Counter Unit		FP2 Pulse I/O Unit	
		NPN output (FP2−HSCT)	PNP output (FP2−HSCP)	NPN output (FP2−PXYT)	PNP output (FP2−PXYP)
Input/output	Occupied I/O	32I, 32O			
	No. of external points	16I, 16O			
Interrupts	No. of interrupts	None, 1/unit, 8/unit			
	Modes	No interrupt mode, intelligent unit that produces interrupts, interrupt unit (settings of switches on side of unit)			
Counter	Channels	4 channels			
	Calculation range	32−bit, with sign (−2,147,483,648 to +2,147,483,647)			
	Calculation speed	200 kHz max. *1			
	Input modes	Direction control, individual, phase differential			
	Special functions	Multiplier function (1, 2, 4)			
Comparison output	No. of outputs	8 max.			
Input time constant	No. of points	16 (Unit: 2 points)			
	Constants	4, 8, 16, 32 μs			
Pulse output	Channels	—		4 channels *2	
	Frequency			1 Hz to 100 kHz (setting unit: 1 Hz)	
	Output modes			Direction control, individual output	
PWM	Channels	—		4 channels *2	
	Output current			0.8 A/channel max.	
	Duty			0 to 100% (setting unit: 1%)	
	Cycle			1 Hz to 30 kHz (setting unit: 1 Hz)	

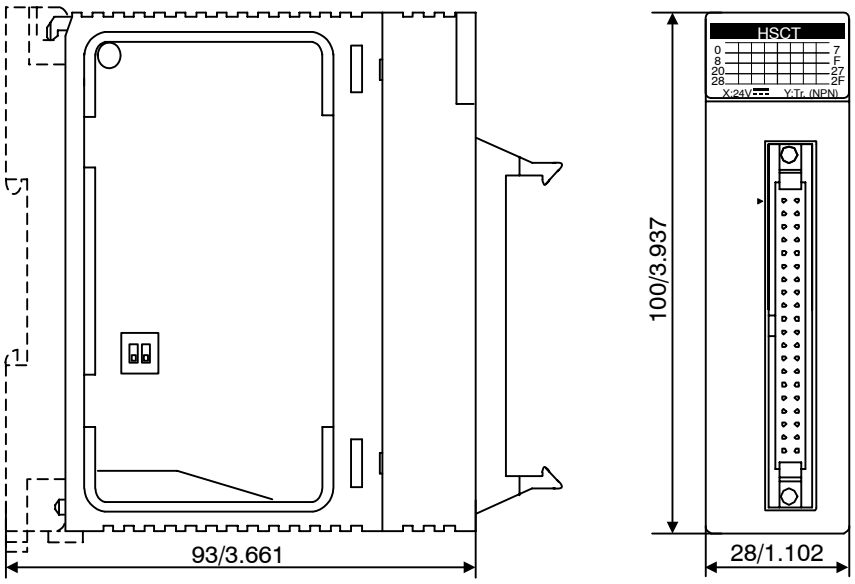
*1: This value is effective when the input time constant (filter) setting is set to “None”.

*2: The same channels are used for pulse output and PWM output. If both functions are being used, the channels to be used for each function are selected as shown in the table below.

Combination	Channel used			
	CH0	CH1	CH2	CH3
1	PWM	PWM	PWM	PWM
2	PLS	PWM	PWM	PWM
3	PLS	PLS	PWM	PWM
4	PLS	PLS	PLS	PWM
5	PLS	PLS	PLS	PLS

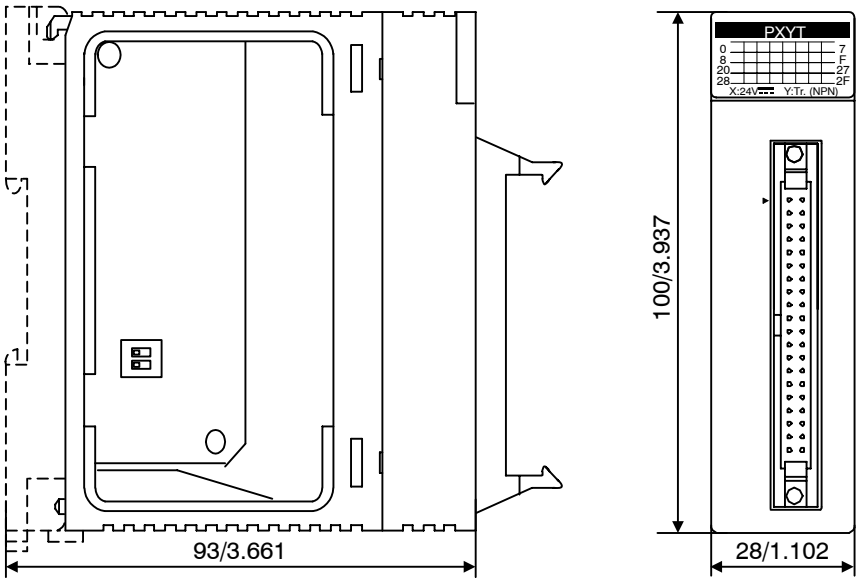
13.4 Dimensions

FP2 High−speed Counter Unit



(unit: mm/in.)

FP2 Pulse I/O Unit



(unit: mm/in.)