



MICROPROCESSOR COUNTER



Product Introduction

FEATURE

The microprocessor based counter is a fast, accurate and user friendly product that can satisfy the user through its multi-function feature. This in turn decreases the need for stock keeping and lowers costs, resulting in increased competitiveness.

The counter is suitable in a wide range of application, e.g. batch counter, totalizer, length measurement, positioning control, chronometer, tachometer, flowmeter, etc. User need only to configure the counter according to the required function.

The counter possesses most of the options available in the market, e.g. memory retention, 100~240VAC power supply, 2 sets of relay output, adjustable action delay for the relay outputs (0.1 ~ 99999.9s), provisions for 2 signal inputs, sampling frequency of maximum 10KHz, a set of DC12V power supply. RS485 communication port (ModBus), counter parameters settings, scaling settings etc.

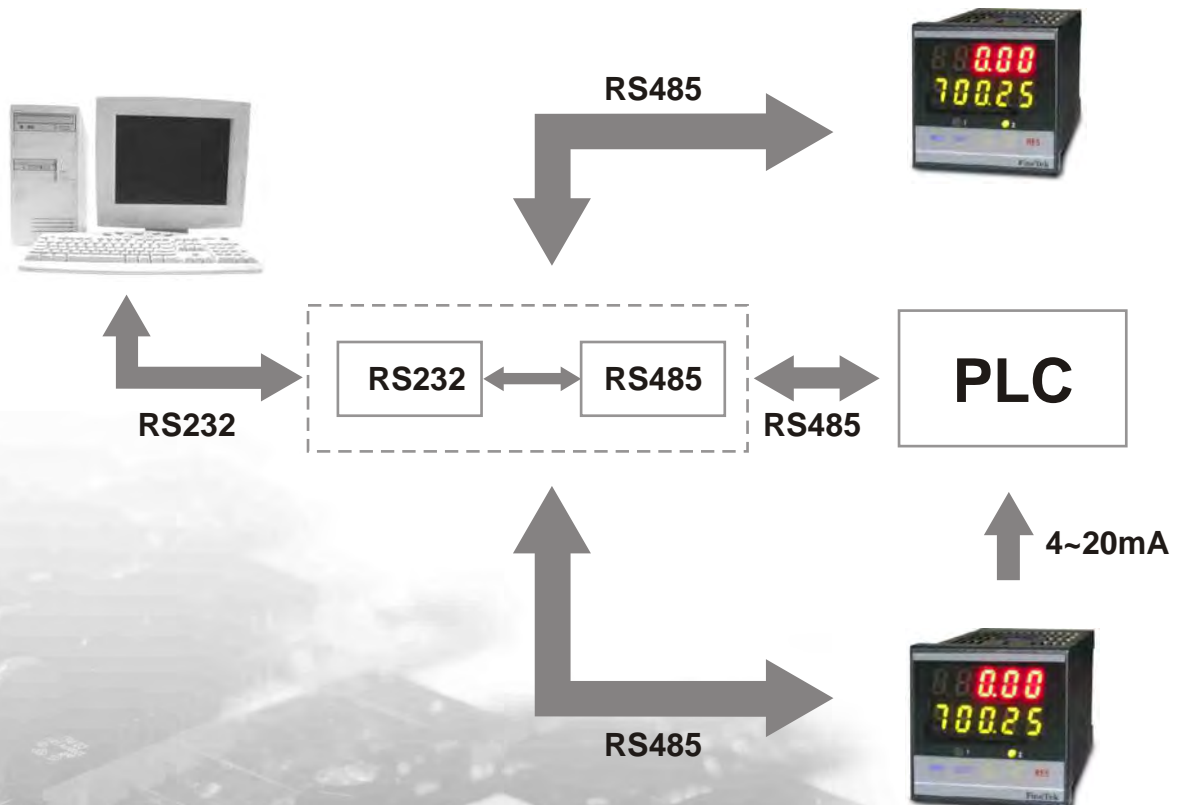
INPUT SIGNAL

- RLC sensor
- PNP open collector input
- Emitter follower
- NPN open collector input
- CMOS type
- TTL type
- Contact type input (Count on short)
- Photocouplers Solid-state type input (Count on ON)
- Contact type input (Count on open)
- Photocouplers Solid-state type input (Count on OFF)

APPLICATIONS

Food Industry, Pulp & Paper Industry, Dyeing, Packaging, Publication, Textile, Pharmaceutical, Tooling, Waste water treatment, Petrochemical, Manufacturing Process, etc.

COUNTER NETWORK CONNECTIONS



PC-12□□ Dip-Type Counter



PC-1220



PC-1240



PC-1230

WORKING PRINCIPLE:

When the counter value reaches the pre-set value, it will output a relay action. (The output duration is adjustable from 0.5~25s ± 10% through a potentiometer in the settings window)

PRODUCT APPLICATION:

Food industry, Pulp & paper, Dyeing, Packaging, Publication, Textile, etc.

FEATURES:

- Memory backup
- Switching Power Supply 100~240VAC 50/60Hz
- Push button Setpoints input.

ORDERING INFORMATION:

PC-12□□-S101-0

Dimension	20--48x48	▲ ▲
	30--96x48	
	40--72x72	

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-1220 : 0.31" 7 segment 4-digits PC-1230 : 0.39" 7 segment 8-digits PC-1240 : 0.36" 7 segment 6-digits
Buttons	1 x reset button
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Counting range	PC-1220 : 99999 PC-1230 : 999999 PC-1240 : 999999
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Pre-set Value	1 point
Contact Output Delay	1 Relay Output (The action duration is adjustable from 0.5~25s ± 10% through a potentiometer in the settings window)
Relay Output	SPST-NO, 3A at 250VAC/30VDC (resistive load)
Memory backup	EEPROM (overwrites: 100,000 times min.) That can store data for 10 years min.
Reset	Manual, Automatic, External terminals.

PC-23 Programmable Counter



PC-2320



PC-2340



PC-2330

WORKING PRINCIPLE

When counter value reaches designated value (up to 2 set-points determined by the user), counter produces relay output. (Relay action time from 0 ~ 99999.9s).

PRODUCT APPLICATION

Food, Pulp & Paper, Dyeing, Packaging, Publication, Textile, Electrical Cabling, etc.

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz
- Counting Speed: 10K cps (Solid-state), 30 cps (Contact)
- Decimal Point Setting
- Prescaling Value
- 2 x designated set-points
- Adjustable output delay timing
- RS485 communication interface (ModBus)

ORDERING INFORMATION

PC - 23 - S 2 0 -

Dimension	20---48x48 30---96x48 40---72x72
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-2320: 0.31" 7 segment 5-digits PC-2330: Upper row 0.39", Lower row 0.28" 7 segment 6-digits PC-2340: 0.36" 7 segment 6-digits
Buttons	5 buttons
Counting Mode	UP, dn, UPdn, UPUP, dir, Ph (AB Phase)
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Counting range	PC-2320 : -9999 ~ 99999 PC-2330 : -99999 ~ 999999 PC-2240 : -99999 ~ 999999
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	PC-2320: Maximum 3 digits PC-2330: Maximum 4 digits PC-2340: Maximum 4 digits
Prescaling Value	PC-2320 : 0.001 ~ 99.999 PC-2330 : 0.001 ~ 999.999 PC-2340 : 0.001 ~ 999.999
Pre-set Value	2 point
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable) PC-2320 : 0.001 ~ 99.999 PC-2330 : 0.001 ~ 999.999 PC-2340 : 0.001 ~ 999.999
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Memory backup	EEPROM (overwrites: 100,000 times min.) That can store data for 10 years min.
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Suitable Sensors	Limit switch, Proximity switch, Optical switch, Conductive switch, Encoder
Reset	Manual, Automatic, External terminals.



PC-3320



PC-3340



PC-3330

WORKING PRINCIPLE

User determines sampling time to process input pulse and calculates speed value (per second / per minute / per hour user selectable) When speed exceeds maximum value (or falls below minimum value), there is a relay output action.

PRODUCT APPLICATION (please refer to page 13)

Safety monitoring of speed for irregularities (too fast/ too slow).

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz
- Counting Speed: 10K cps (Solid-state), 30 cps (Contact)
- Decimal Point Setting
- Prescaling Value
- 2 x designated set-points
- Adjustable output delay timing
- RS485 communication interface (ModBus)
- Sampling Timing 1 ~ 99s
- Speed unit (Spd/s, Spd/min, Spd/hr)

ORDERING INFORMATION

PC-33 - S 2 -

Dimension	20---48x48 30---96x48 40---72x72
Analog Output	0---None 2---4~20mA
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-3320: 0.31" 7 segment 5-digits PC-3330: Upper row 0.39", Lower row 0.28" 7 segment 6-digits PC-3340 : 0.36" 7 segment 6-digits
Buttons	5 buttons
Counting Mode	UP, dn, UPdn, UPUP, dir, Ph (AB Phase)
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Counting range	PC-3320 : -9999 ~ 99999 PC-3330 : -99999 ~ 999999 PC-3340 : -99999 ~ 999999
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	PC-3320: Maximum 3 digits PC-3330: Maximum 4 digits PC-3340: Maximum 4 digits
Prescaling Value	PC-3320 : 0.001 ~ 99.999 PC-3330 : 0.001 ~ 999.999 PC-3340 : 0.001 ~ 999.999
Sampling Time	0 ~ 99s
Speed unit	2 point
Pre-set Value	Spd/s, Spd/min, Spd/hr
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable) PC-3320 : 0.001 ~ 99.999 PC-3330 : 0.001 ~ 999.999 PC-3340 : 0.001 ~ 999.999
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Suitable Sensors	Limit switch, Proximity switch, Optical switch, Conductive switch, Encoder
Reset	Manual, Automatic, External terminals.

PC-43 Programmable Batch-Counter



PC-4320



PC-4340



PC-4330

WORKING PRINCIPLE

Food, Feed, Dyeing, Pharmaceutical, Injection Moulding, Various Machinery, Electrical Cabling and wiring, etc.

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz Counting
- Speed: 10K cps (Solid-state), 30 cps (Contact)
- Decimal Point Setting
- Prescaling Value
- 2 x designated preset-points (pre-set1: batch, Pre-set2: count)
- Adjustable output delay timing
- RS485 communication interface (ModBus)

ORDERING INFORMATION:

PC - 43 - S 2 0 -

Dimension	20---48x48 30---96x48 40---72x72
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-4320: 0.31" 7 segment 5-digits PC-4330: Upper row 0.39", Lower row 0.28" 7 segment 6-digits PC-4340: 0.36" 7 segment 6-digits
Buttons	5 buttons
Counting Mode	UP, dn, UPdn, UPUP, dir, Ph (AB Phase)
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Counting range	PC-4320 : -9999 ~ 99999 PC-4330 : -99999 ~ 999999 PC-4340 : -99999 ~ 999999
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	PC-4320: Maximum 3 digits PC-4330: Maximum 4 digits PC-4340: Maximum 4 digits
Prescaling Value	PC-4320 : 0.001 ~ 99.999 PC-4330 : 0.001 ~ 999.999 PC-4340 : 0.001 ~ 999.999
Pre-set Value	2 points: Pre-set1: batch Pre-set2: Individual count
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable) PC-4320 : 0.1 ~ 9999.9s PC-4330 : 0.1 ~ 99999.9s PC-4340 : 0.1 ~ 99999.9s
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Memory backup	EEPROM (overwrites: 100,000 times min.) That can store data for 10 years min.
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Suitable Sensors	Limit switch, Proximity switch, Optical switch, Conductive switch, Encoder
Reset	Manual, Automatic, External terminals.

PC-53 Programmable Chronometer



PC-5320



PC-5340



PC-5330

WORKING PRINCIPLE

The timer starts timing upon receiving a start signal. When the timer values reaches the pre-set value, relay output actions. (Relay action time from 1 ~ 99999.9s). User can set h/min, min/s or s/0.1ms.

PRODUCT APPLICATION

Petrochemical, Bio-chemical, Medical, Dyeing, Chemical equipment, etc.

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz
- 2 modes of timing
- Timing parameters 99hrs 59mins
- Timer display (user set h/min, min/s or s/0.1s)
- 2 x designated preset-points
- Adjustable output delay timing
- RS485 communication interface (ModBus)

ORDERING INFORMATION:

PC - 53 - S 2 0 -

Dimension	20---48x48 30---96x48 40---72x72
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-5320: 0.31" 7 segment 5-digits PC-5330: Upper row 0.39" Lower row 0.28" 7 segment 6-digits PC-5340: 0.36" 7 segment 6-digits
Buttons	5 buttons
Timing Mode	2 modes 1 st mode: IN1, first clock starts timer IN1, second clock stops timer 2 nd mode: IN1 clock start timer IN2 clock stop timer
Counting range	99hrs 59mins
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	PC-2320: Maximum 3 digits PC-2330: Maximum 4 digits PC-2340: Maximum 4 digits
Prescaling Value	PC-5320 : 0.001 ~ 99.999 PC-5330 : 0.001 ~ 999.999 PC-5340 : 0.001 ~ 999.999
Pre-set Value	2 point
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable) PC-5320 : 0.1 ~ 9999.9s PC-5330 : 0.1 ~ 99999.9s PC-5340 : 0.1 ~ 99999.9s
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Timer Display	User selectable h/min, min/s, 0.1s/s
Memory backup	EEPROM (overwrites: 100,000 times min.) That can store data for 10 years min.
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Suitable Sensors	Limit switch, Proximity switch, Optical switch, Conductive switch, Encoder
Reset	Manual, Automatic, External terminals.



PC-6340

WORKING PRINCIPLE

User defined sampling timing (1-99s) to acquire sampling pulse signal. Signal is processed to display per second (per minute / per hour) instantaneous flow rate in 4 ~ 20mA signal. When flow rate exceeds pre-set value, relay 1 actions. When total flow reaches pre-set value, relay 2 actions (Relay action time from 1 ~ 99999.9s). Includes a linear flow rate signal output 4~20mA.

PRODUCT APPLICATION

Petrochemical, Food, Feed, Water Treatment, Dyeing etc.

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz
- Counting Speed: 10K cps (Solid-state), 30 cps (Contact)
- Decimal Point Setting
- Prescaling Value
- 2 x designated preset-points
- Adjustable output delay timing
- Sampling Timing 1 ~ 99s
- Instantaneous Flow rate units (per second / per minute / per hour)
- Analog output 4 ~ 20mA

ORDERING INFORMATION:

PC - 6340 - S 2 -

Analog Output	0---None 2---4-20mA
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	0.36" 7 segment 6-digits
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Counting range	1~99s
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	0.001 ~ 999.999
Sampling Time	1~99s
Flow Rate Units	Flow rate/s, Flow rate/min, Flow rate/hr
Pre-set Value	2 points
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable 0.1 ~ 99999.9s)
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Analog Output	4~20mA
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Reset	Manual, Automatic, External terminals.



PC-7320



PC-7340



PC-7330

WORKING PRINCIPLE

Principle: Includes 4 different functions for Counter, Batch-Counter, Chronometer and Tachometer

PRODUCT APPLICATION

Food, Feed, Dyeing, Pharmaceutical, Injection Moulding, Various Machinery, Electrical Cabling and wiring, etc.

FEATURES

- Switching Power Supply 100~240VAC 50/60Hz
- Counting Speed: 10K cps (Solid-state), 30 cps (Contact)
- Decimal Point Setting
- Timing Parameters 99hrs 59mins
- Timer display (user set h/min, min/s or s/0.1s)
- Decimal Point Settings
- Prescaling Value
- 2 x designated preset-points (pre-set1: batch, Pre-set2: count)
- Adjustable output delay timing
- RS485 communication interface (ModBus)
- Sampling Timing 1 ~ 99s
- Speed Units: Speed/s, Speed/min, Speed/hr

ORDERING INFORMATION

PC-73□□-S20□-□

Dimension	20---48x48 30---96x48 40---72x72
Data Retention	0---No Data Retention 1---With Data Retention
Communication	0---None 1---RS-485

SPECIFICATIONS

Power Supply	100~240VAC 50/60Hz (85%~110% of rated supply voltage range)
Power Supply for sensor	DC12V, 70mA
Power Consumption	Max. 7W
Operating Temperature	0 ~ 55°C
Storage Temperature	-10 ~ 70°C (20 ~ 85%RH)
Display	PC-7320 : 0.31" 7 segment 5-digits PC-7330 : Upper row 0.39", Lower row 0.28" 7 segment 6-digits PC-7340 : 0.36" 7 segment 6-digits
Buttons	5 buttons
Counting Mode	up, down, AB Phase
Counting Speed	10K cps(with Solid-state input only) ; 30 cps(with contact input)
Timing Mode	1 st mode : IN1, first clock starts timer IN1, second clock stops timer 2 nd mode : IN1 clock start timer IN2 clock stop timer
Counting range	PC-7320 : -9999 ~ 99999 PC-7330 : -99999 ~ 999999 PC-7340 : -99999 ~ 999999
Input method (Switchable)	<u>No-Voltage input</u> ON impedance: max. 1KΩ OFF impedance: min. 100KΩ <u>Voltage input</u> High (logic) level: 4~24VDC Low (logic) level: 0~2VDC
Decimal Point Setting	PC-7320: Maximum 3 digits PC-7330: Maximum 4 digits PC-7340: Maximum 4 digits
Prescaling Value	PC-7320 : 0.001 ~ 99.999 PC-7330 : 0.001 ~ 999.999 PC-7340 : 0.001 ~ 999.999
Pre-set Value	2 points: Pre-set1: batch Pre-set2: Individual count
Contact Output Delay	2 sets Relay Output (Relay action timing adjustable) PC-7320 : 0.1 ~ 9999.9s PC-7330 : 0.1 ~ 99999.9s PC-7340 : 0.1 ~ 99999.9s
Relay Output	SPST-NOx2, 3A at 250VAC/30VDC (resistive load)
Timer Display	User selectable h/min, min/s, 0.1s/s
Memory backup	Optional
Communication Interface	RS485 Transmission speed 1200-57600bps selectable
Suitable Sensors	Limit switch, Proximity switch, Optical switch, Conductive switch, Encoder
Reset	Manual, Automatic, External terminals.

Sensor Connection / Dip Switch Settings

PC-□2□□ Connections to various sensors and dip switch settings

PS: ● Blackened box indicates position of dip switch

- A reset is required once the dip stick is set
- When in chronometer mode, units of time is seconds

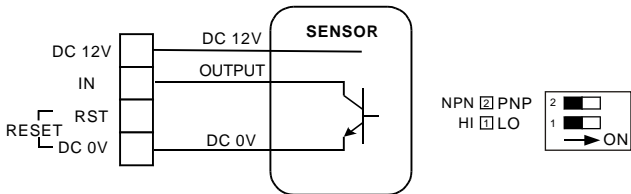
PC-12□□: Sensors input wiring diagram and DIP switch setting (in the setting window of plastic housing)

PS: ● Black rectangle shows the setting of DIP switch
● PC-12□□ should power off and power on again whenever changing DIP switch setting.

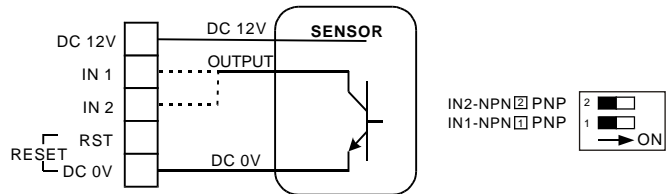
PC-□320 & PC-□340: Sensors input wiring diagram and DIP switch setting (in the setting window of plastic housing)

PS: ● Black rectangle shows the setting of DIP switch
● PC-12□□ should power off and power on again whenever changing DIP switch setting.

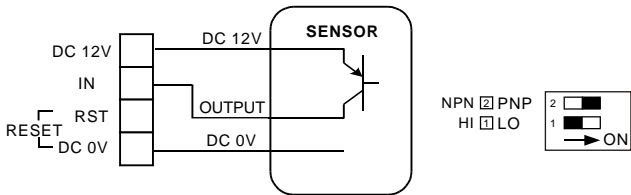
NPN TYPE



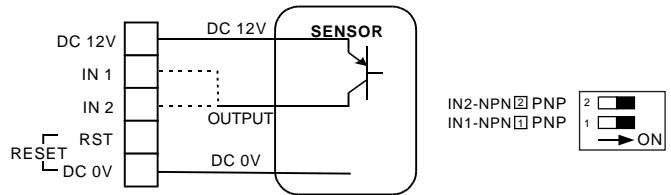
NPN TYPE



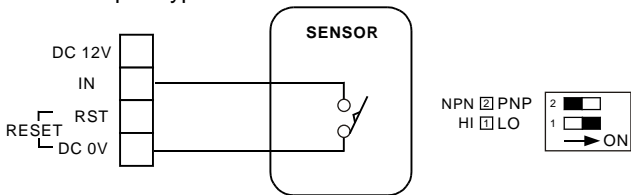
PNP TYPE



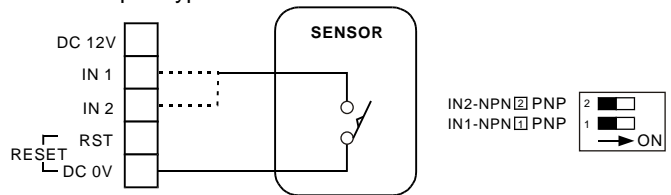
PNP TYPE



Contact Input Type



Contact Input Type

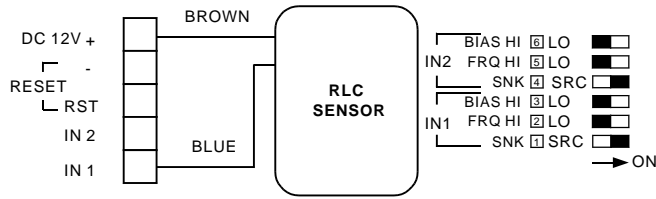


Sensor Connection / Dip Switch Settings

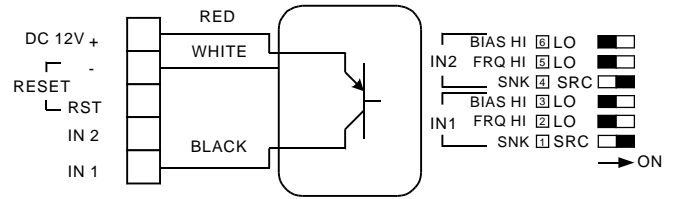
PC-□3□□ Connections to various sensors and dip switch settings

PS. ● Blackened box indicates position of dip switch

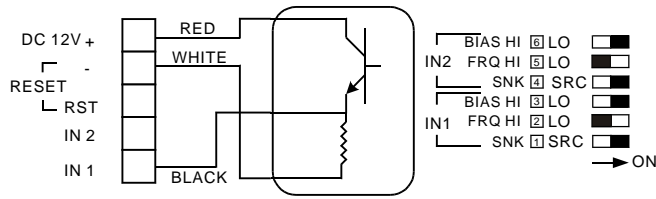
PNP open collector sensor (2-Wire)



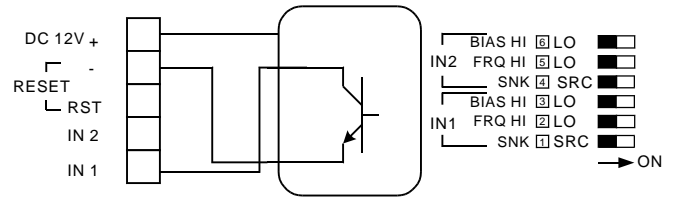
PNP open collector sensor (3-Wire)



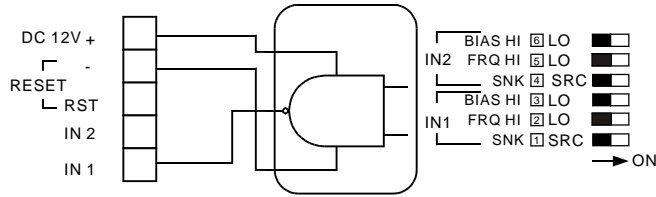
Emitter follower



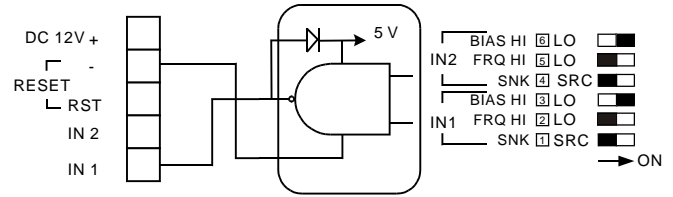
NPN open collector sensor



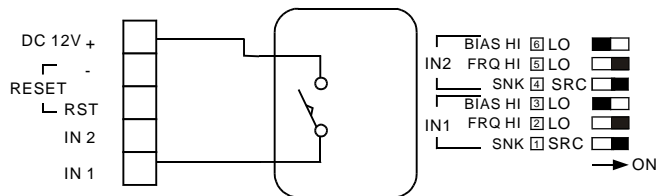
CMOS Type



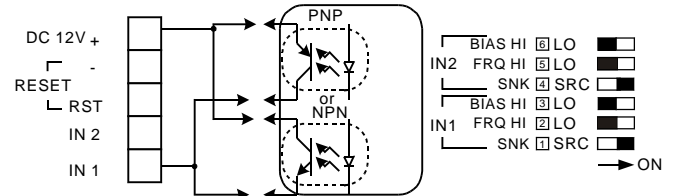
TTL Type



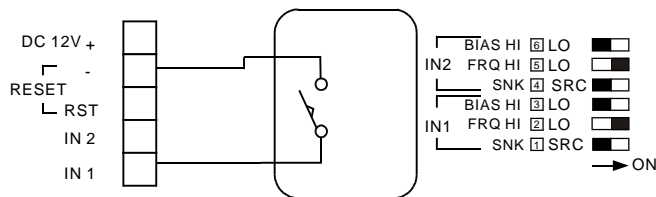
Contact Input Type (Count on short)



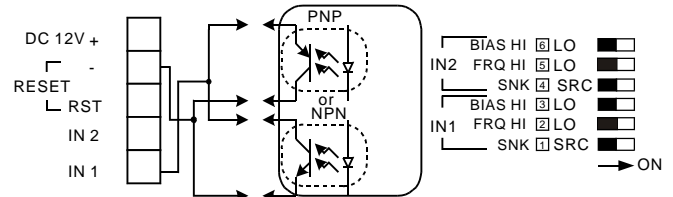
Potocouplers Solid-state Type Input (Count on ON)



Contact Input Type (Count on open)

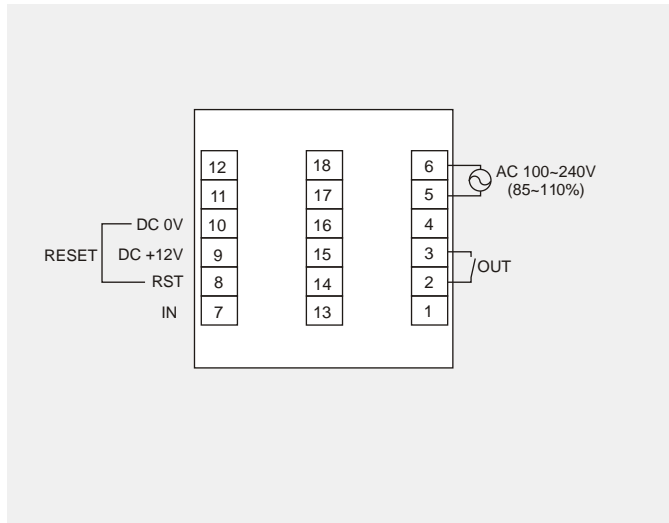


Potocouplers Solid-state Type Input (Count on OFF)

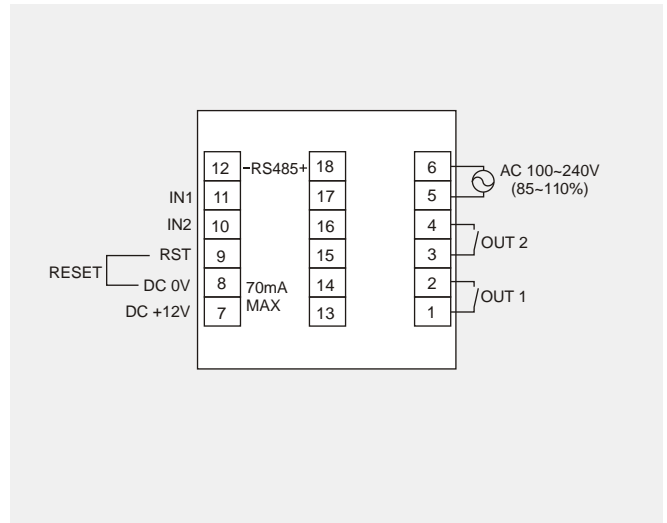


Dimension / Panel Cutout

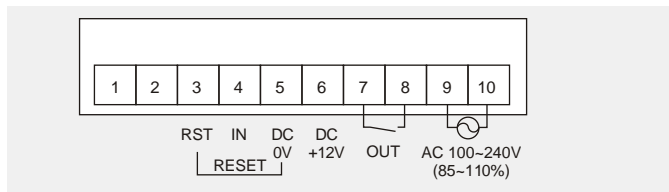
PC-1220



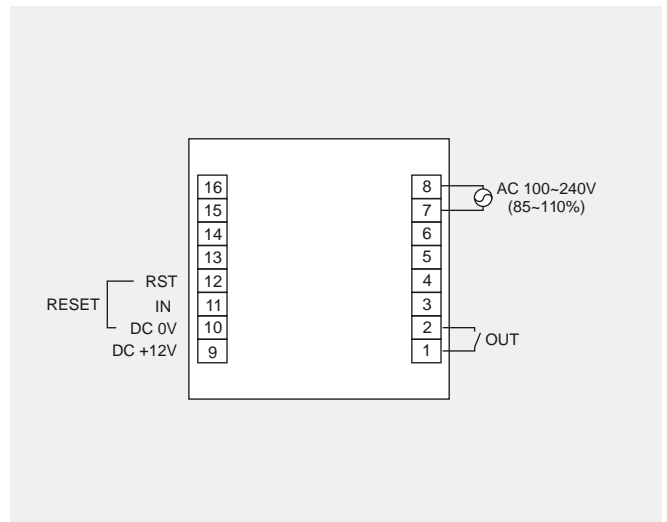
PC-□320 □ : 2, 3, 4, 5, 7



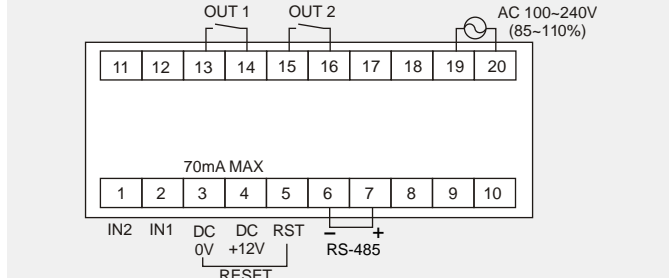
PC-1230



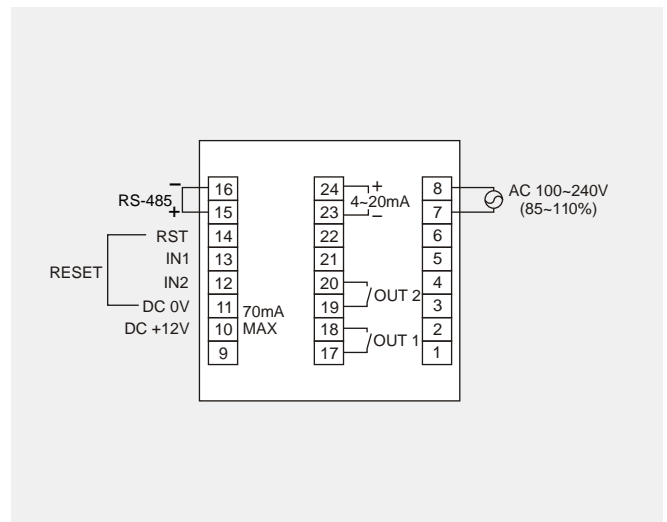
PC-1240



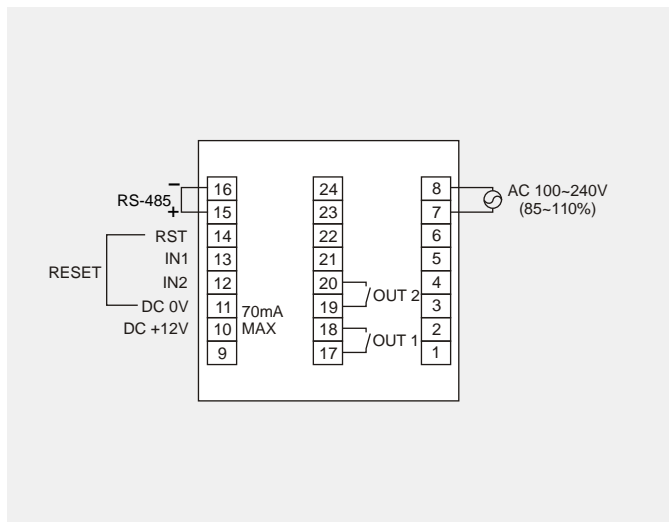
PC-□330 □ : 2, 3, 4, 5, 7



PC-6340



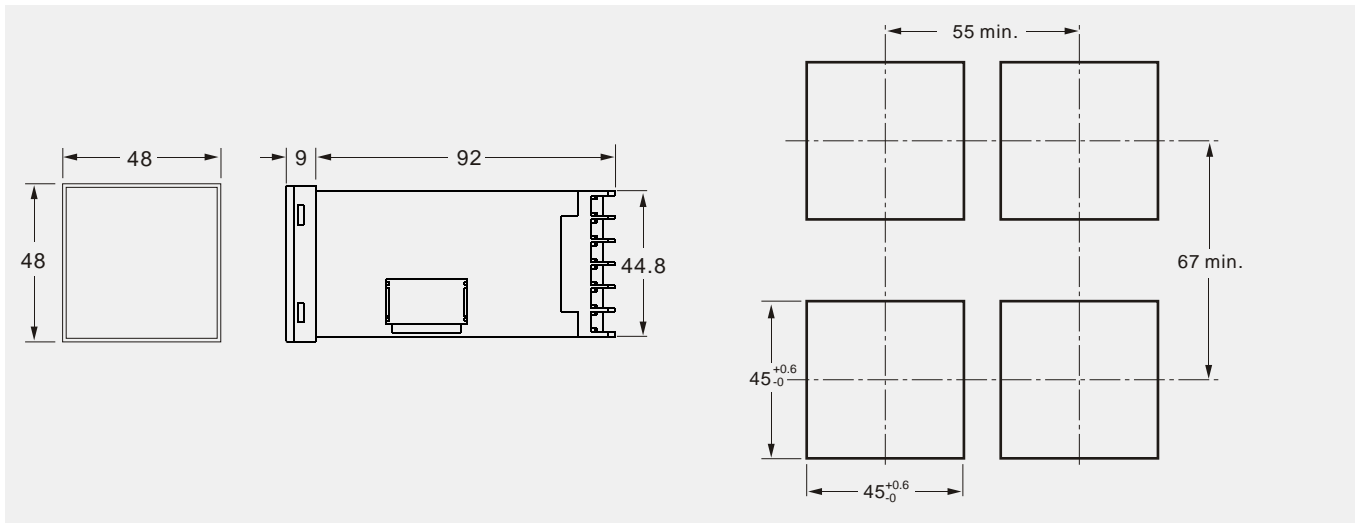
PC-□340 □ : 2, 3, 4, 5, 6, 7



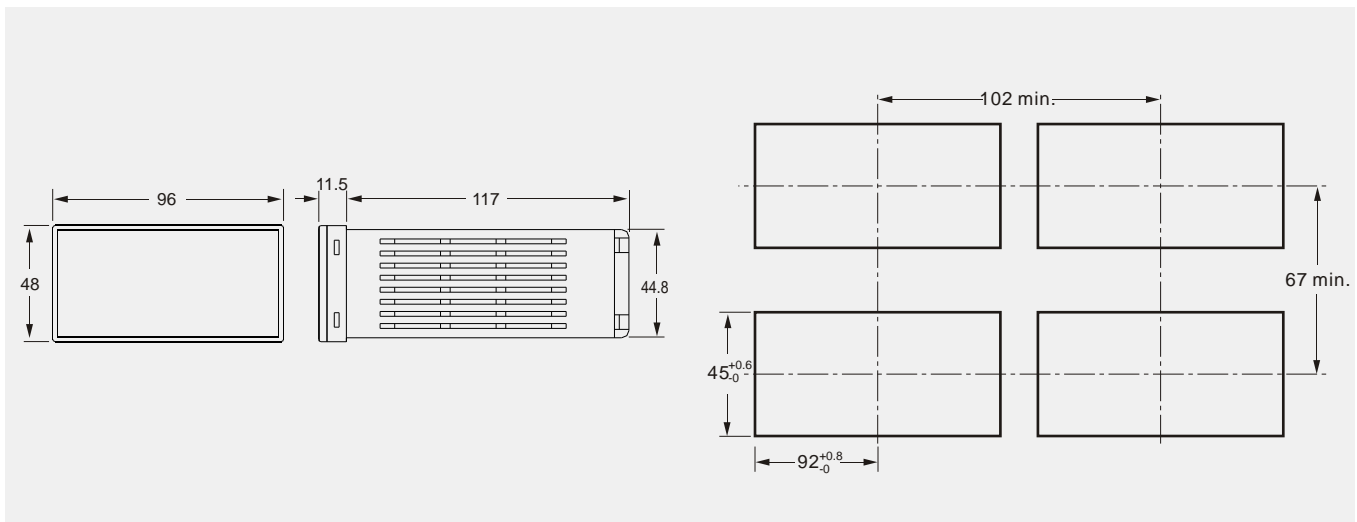
Dimension / Panel Cutout

DIMENSION / PANEL CUTOUT

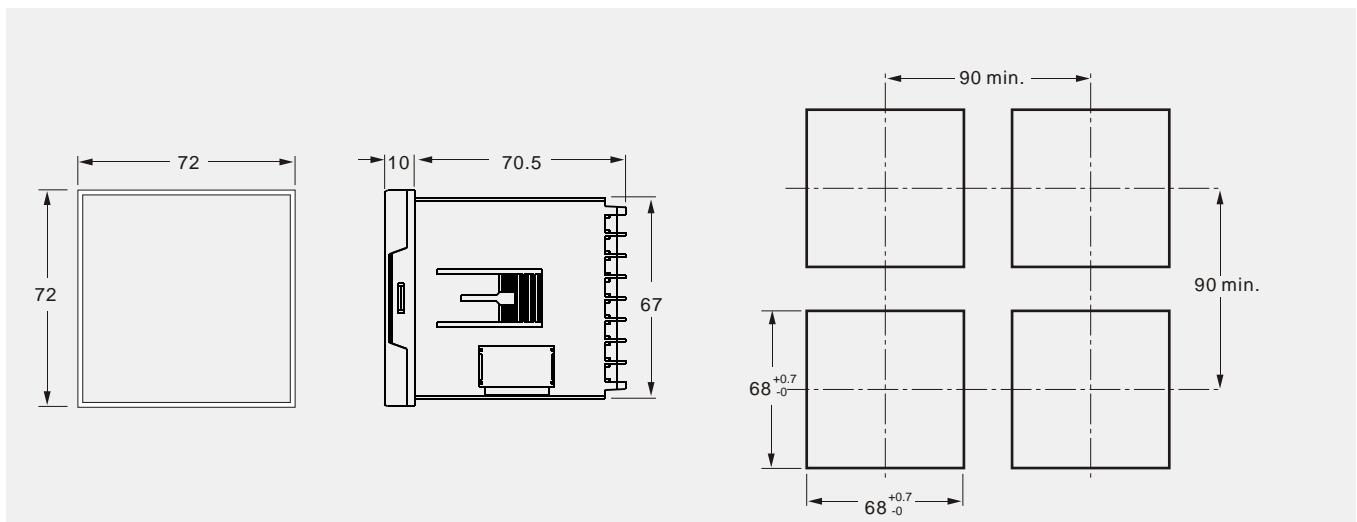
PC-□□20 : 48mm(H) x 48mm(W) x 101mm(D)



PC-□□30 : 96mm(H) x 48mm(W) x 128.5mm(D)



PC-□□40 : 72mm(H) x 72mm(W) x 80.5mm(D)



Function	Diagrams	Description
UP		(1) IN1 input (Increment) (2) Display
Dn		(1) IN1 input (Decrement) (2) Display
Updn		(1) Input IN1, count in the direction of the cycle (2) Input IN2, count in the opposite direction from the cycle (3) Display (0→P) 2-channel up/down counter (4) Display (P→0) 2-channel up/down counter
UPUP		(1) Input IN1, count in the direction of the cycle (2) Input IN2, count in the direction of the cycle (3) Display (0→P) 2-channel up/down counter (4) Display (P→0) 2-channel up/down counter
Dir		(1) Input IN1 input pulses (2) Input IN2 reversal of counting direction (3) Display (0→P) 1-channel up/down counter (4) Display (P→0) 1-channel up/down counter
Ph		(1) Input IN1 (signals 90° out of phase) count on an edge (2) Input IN2 reversal of counting direction if IN2 ahead of IN1 (3) Display (0→P) (4) Display (P→0)

Speed / Line Speed measurement

A conveyer belt which the radius of gyration for the pulley is 0.5m, a sensor on the pulley outputs one pulse per revolution.

Hence $PPr = 1$ pulse/revolution

rP :

- 1: rotational speed per second
- 60: rotational speed per minute
- 3600: rotational speed per hour

$$PSCL: 2pr = 2p \cdot (0.5) = pm \text{ pulse/s}$$

TL: Update time of measurement

Tr: Tr must be shorter than TL. Tr is used for check the validity of measurement under TL.

