LINE SEIKI

INSTRUCTION MANUAL

G20 SERIES PRESET COUNTER

G20 − 0□□□ 4□□□
1□□□ 5□□□
2□□□ 6□□□
3□□□

* Before you use G20 series, please read this manual to use this counter correctly.
* Keep this manual carefully.
* Contents of this manual are subject to change without notice.

NOTICE ON SAFETY

With reading this instruction manual, use correctly before fixing, operating, maintaining and examining.

Keep the following notices not to cause electric shock, injury and damage of device.

⚠ WARNING

To prevent from the dangerous condition of user's death or heavy injury, look through the following warning.

◇Supply the voltage between the terminal No.29 & No.30 of unit in the range of 85-264VAC. Be sure to confirm the voltage not to cause destruction of the unit by supplying the voltage out of applicable range.

◇Be sure to confirm if there is problem such like looseness of screw, wrong wiring..etc., after wiring.

◇Do not take the unit apart or modify.

<REQUESTS>

◇Do not use the unit under the following evnironment.
- Explosive gas, Inflammable gas, Corrosive gas.
- High humidity, Dewdrop.
- Intensive temperature difference
- Intensive vibration.

◇Do not drop or give the high shock to the counter.

◇Be sure to use load current within nominal.

◇Keep away the wiring from the high voltage or current lines.

◇Do not use the blank terminals as relay terminal.

◇Keep the input signal source, counter itself or it's wiring away from the noise source when the counter is used in the noise. It is effective to make the wireleads for input to be shielded.

◇In case there are surge and noise on power supply, connect the line noise filter with counter.

◇In case of wiring for the communication cable outside, equip the baristor to prevent the counter from the lightning shock.

◇Pay attention to the excessive fastening for the screw of terminal and panel clamper.

FEATURES

- Easy operation by 10 keys
- Power supply, 100−240VAC
- Prescale function
- Tachometer function
- Communication function (RS−485)
- Programmable count start value
- DIN72×144mm
- Depth, 66mm. Compact size
- Dust & Splash proof

MODEL

G20−□□□□

TYPE
- 0 : 1 level preset
- 1 : 2 level preset
- 2 : 1 level preset+prewarn
- 3 : 1 level preset+batch preset
- 4 : 1 level preset+prewarn+batch preset
- 5 : 2 level preset+batch preset
- 6 : 4 level preset

OUTPUT
- 0 : Relay output
- 1 : Open collector output

INPUT
- 0 : Open collector input
- 1 : Voltage input

TACHOMETER FUNCTION
- 0 : with Tachometer

SPECIFICATIONS

1) DISPLAY
Upper display : Red LED 14.22(H) x 7.8(W)
Lower display: Green LED 10.00(H) x 5.5(W)

2) NUMBER OF DIGITS
Upper display : Preset counter 6 digits
Totalizer 6 digits
Tachometer 6 digits
Batch counter 6 digits
Lower display : Preset value 6 digits

3) INDICATOR
Yellow LED : It turns on when the display is totalizer & tachometer.
Green LED : It turns on when the display shows preset value.
Red LED : It turns on when the unit let out the output signal.

4) SETTING WAY
10 keys (numerical keys)operation

5) SETTING RANGE
Preset value (P1～P4) : −99999～999999
Prewarn value (PW) : 0～999999
Batch preset value (PB) : 0～999999

6) PRESCALE
Multiplying : 0.00001～999.999 Dividing : 1～9999

7) DECIMAL POINT POSITION
0.0～0.00000

8) COUNT START VALUE
−99999～999999

9) INPUT
- Open collector input
  Sink current : 10mA L : 0～6V
- Voltage input
  L : 0～4V H : 6～30V (Input impedance 7kΩ)

10) COUNT SPEED
30Hz (Pulse width 16ms Duty 1 : 1)
1kHz (Pulse width 500μs Duty 1 : 1)
5kHz (Pulse width 100μs Duty 1 : 1)
8kHz (Pulse width 62.5μs Duty 1 : 1)

11) TYPE OF INPUT SIGNAL
Add/Subtract/Individual add, subtract/Quadrature

12) OPERATION
Overrun/Auto-reset/Equal/Upper-lower limit
Model with prewarn function, not include Upper-lower limit
Model with batch function, not include Upper-lower limit/Equal

13) OUTPUT
One shot pulse/Latch

14) OUTPUT TIME
10ms～9990ms (Available to set with 10ms in one unit)

15) TYPE OF OUTPUT
- Relay output
  1c (250VAC 3A／30VDC 3A resistance load)
- Open collector output
  (30VDC 100mA max.)

16) OUTPUT DELAY TIME
6ms max.

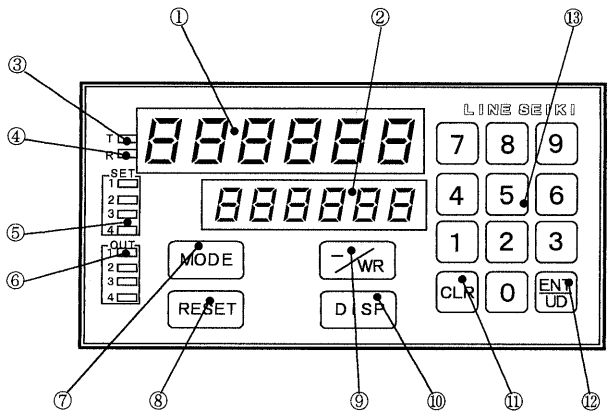
17) RESET
Front reset
Remote reset

18) KEY LOCK
Prohibition for front key reset, preset value editing, count start value editing or editing data in program mode.

19) TACHOMETER
1/TAU, Standard sampling (Measuring accuracy : ±0.1%)
What is 1/TAU?
The 1/TAU method of rate calculation is based on accurately measuring the time period between consecutive input pulses. This time period is called "TAU".

20) COMMUNICATION
RS−485 Serial interface
Read count value, preset value or count start value.
Send preset value or count start value.
Read the condition of reset and preset output condition.

FRONT PANEL FEATURES



※The design of front membrane is different according to each models.

① Display for count value, tachometer value, and programming items
② Display for preset value and programmed data
③ Indicator for total counter
④ Indicator for tachometer
⑤ Indicator for preset value: SET 1 − 1 level preset
2 − 2 level preset
3 − 3 level preset
4 − 4 level preset
P − Prewarn
B − Batch preset
⑥ Indicator for output: OUT 1 − 1 level preset output
2 − 2 level preset output
3 − 3 level preset output
4 − 4 level preset output
P − Prewarn output
B − Batch output
⑦ Mode key
⑧ Reset Key
⑨ −/WR key
⑩ DISP key
⑪ CLR key
⑫ ENT/UD key
⑬ 10 keys (0 - 9)

ELECTRIC SPECIFICATIONS

1) POWER SUPPLY
100～240VAC −15%、+10%

2) POWER CONSUMPTION
approx. 7VA

3) SENSOR POWER SOURCE
12VDC ±10% 100mA max.

4) MEMORY
EEPROM (10 years : can be used 100,000 times)

5) OPERATING TEMPERATURE
−10～50℃ (NON FREEZING)

6) OPERATING HUMIDITY
45～85%RH (NON CONDENSING)

7) INSULATION RESISTANCE
100MΩ (at 500VDC) minimum

8) TEST VOLTAGE
1500VAC for one (1) minute

9) TEST NOISE
Between the terminal on power supply : ±2000V
Between the terminal on signal input : ± 500V

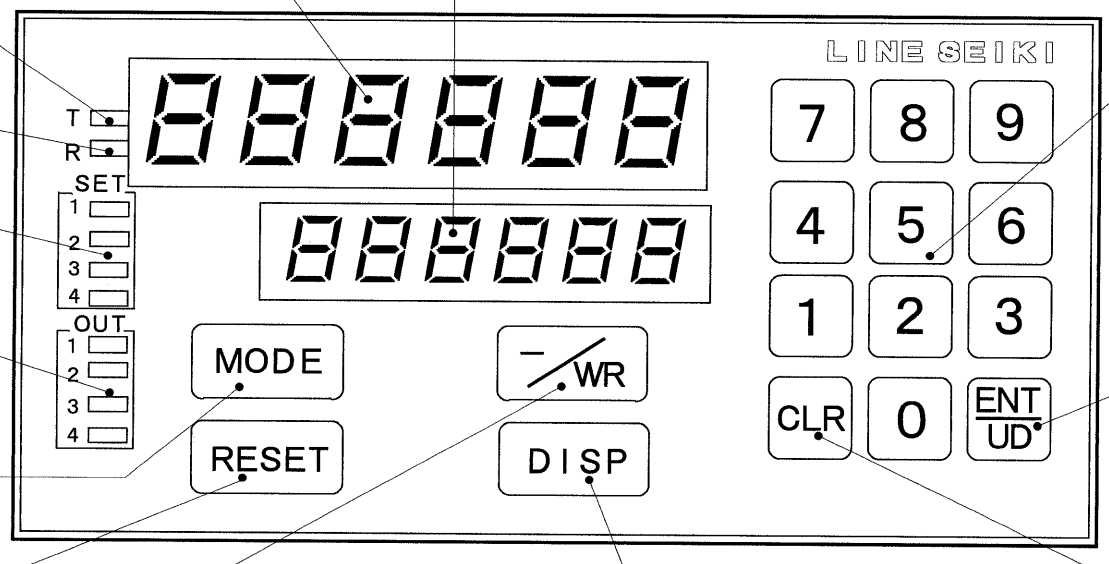
10) TEST OSCILLATION
Endurance : 10～55Hz, amplitude 1.5mm, 3 hours(1 cycle 3 minutes) to X,Y,Z 3 directions
Operation : 10～55Hz, amplitude 1.5mm, 3 hours(1 cycle 3 minutes) to X,Y,Z 3 directions

11) TEST SHOCK
Endurance : 300m／s² (approx 30G) 10 times to X,Y,Z 3 directions
Operation : 100m／s² (approx 10G) 10 times to X,Y,Z 3 directions

12) SIZE
DIN72×144mm

13) WEIGHT
approx. 360g

FRONT PANEL FEATURES



●UPPER DISPLAY
・Shows count values, tachometer values and programming items when the unit is in the PROGRAM MODE.

●LOWER DISPLAY
・Shows preset values and programmed data. It shows value below the decimal point of count value by pressing every [ENT/UD] key.

●INDICATOR FOR TOTALIZER
・Light is truning on while total count is on the display.

●INDICATOR FOR TACHOMETER
・Light is turning on while tachometer value is on the display.

●INDICATOR FOR PRESET VALUE
・It shows which preset level is on the display.

●INDICATOR FOR OUTPUT
・It shows which preset output is on.

●TEN KEYS (0～9)
・These keys are used to input the preset values and enter the PROGRAM MODE with pressing mode keys.

●ENT/UD KEY
・It defines the numeric value when the preset value is edited.
・In the PROGRAM MODE, this key is used to store the edited data in the memory.
・It shows the value below decimal point of count value or tachometer value.

●MODE KEY
・This key is used to enter the PROGRAM MODE.
・Programming items can be changed by pressing MODE key in the PROGRAM MODE.

●RESET KEY
・The key is used to reset the count value and output.

●−/WR KEY
・It shows the count start value.
・This key is used to set − (minus) code when preset or count start value is edited.

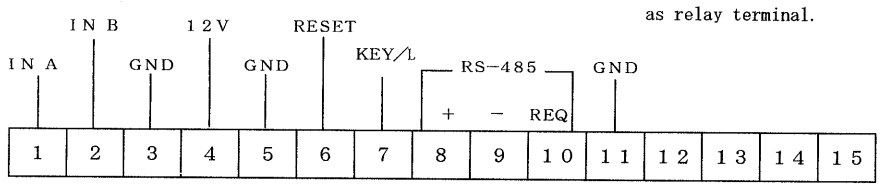
●DISP KEY
・This key is used when changing the programming items and returning to run mode from the PROGRAM MODE.

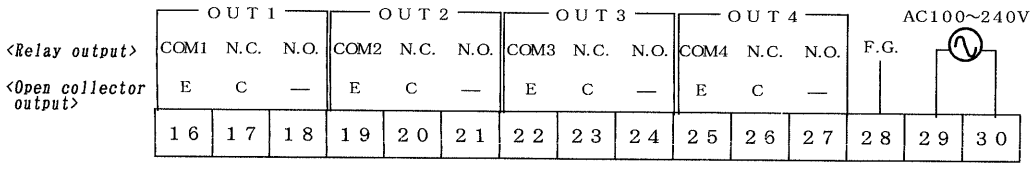
●CLR KEY
・This key is used to clear the value when preset value is edited.

WIRING AND REAR TERMINALS

●REAR TERMINALS

※CAUTION : Do not use the blank terminal as relay terminal.



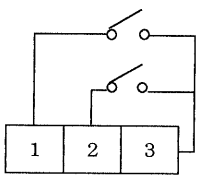


※OUT 1～4 are different according to each models. Refer to the LIST FOR OUTPUT TERMINALS shown in the light.

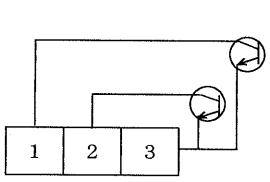
●POWER SUPPLY
Supply the voltage of 100-240VAC with terminals between terminal No. 29 and 30.

●F. G. (FLAME GROUND)
Use this F. G. terminal (terminal 29) connecting with the ground.

●INPUT
<Open collector input type>
・Contact input



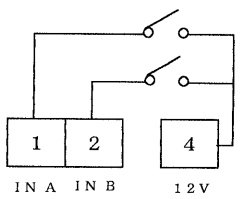
・Open collector input



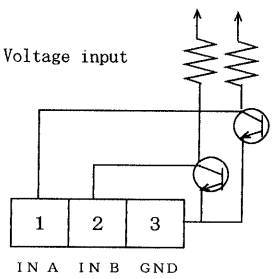
INPUT MODE	IN A	IN B
UP	ADD	—
DO	SUB	—
UPDO	ADD	SUB
QUAD	90°	QUAD

In case input mode is UP(add) or DO(sub.), IN A is validity, but IN B is invalid.

<Voltage input type >
・Contact input



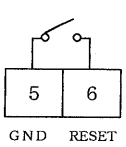
・Voltage input



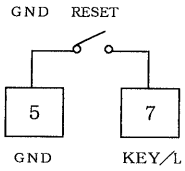
《NOTE》
・Be sure to turn the power supply off in case of doing the wiring.
・Supply the voltage at the range of 85-264VAC between the terminal 29&30.
・Confirm the looseness of screw, wrong wiring..etc., after wiring.
・Avoid the excessive fastening for terminal of the unit.

●OUTPUT
Refer to the REAR TERMINALS and the LIST FOR OUTPUT TERMINALS.

●REMOTE RESET
By shorting the terminals between "No. 6" and "GND", count value and output will be reset. (Under shorting, counter does not accept for any input pulse)



●KEY LOCK
By shorting the terminals between "No. 7" and "GND", programming or editing selected in KEY LOCK MODE is invalid.



●SERIAL COMMUNICATION (RS−485)
Use the terminal No. 8 and 9 in case communication is required.

●COMMUNICATION REQUEST
By shorting the terminals between "No. 10" and "GND", it will be available to read the data easily.

●SENSOR POWER SOURCE
Terminal No. 4 is used as the sensor power source. (12VDC ± 10% 100mA max.)

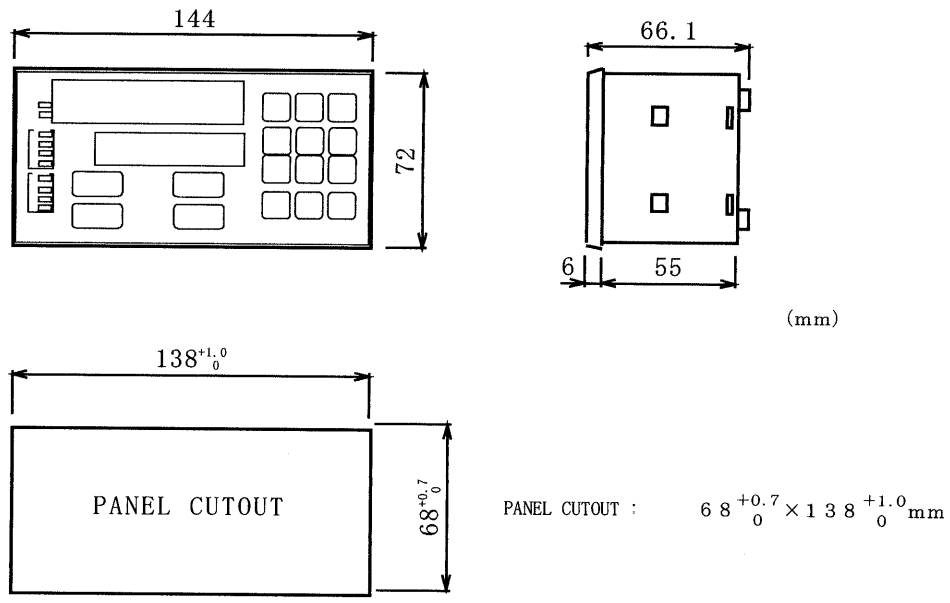
●LIST FOR OUTPUT TERMINALS

型 式	OUT1	OUT2	OUT3	OUT4
G20 − 0□□□	OUT	—	—	—
1□□□	OUT1	OUT2	—	—
2□□□	PREWARN	OUT	—	—
3□□□	OUT	BATCH	—	—
4□□□	PREWARN	OUT	BATCH	—
5□□□	OUT1	OUT2	BATCH	—
6□□□	OUT1	OUT2	OUT3	OUT4

(− : NOT AVAILABLE)

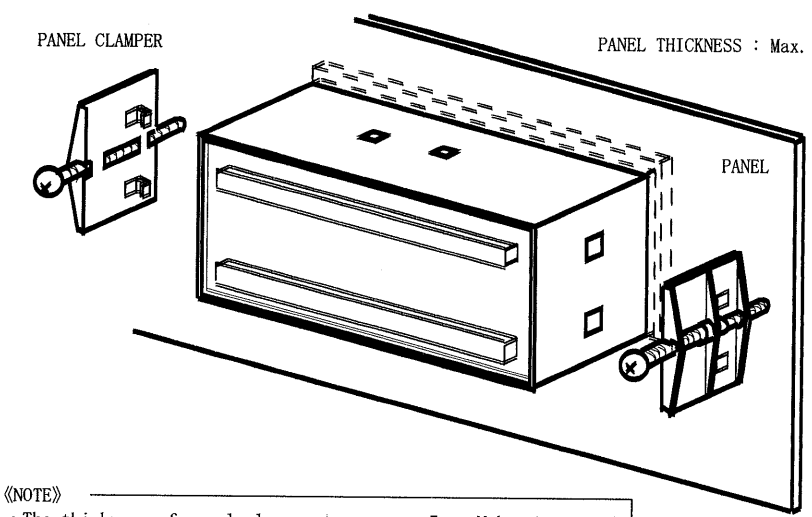
DIMENSIONS AND MOUNTING

●EXTERNAL DIMENSIONS



PANEL CUTOUT : $68^{+0.7}_{0} \times 138^{+1.0}_{0}$ mm

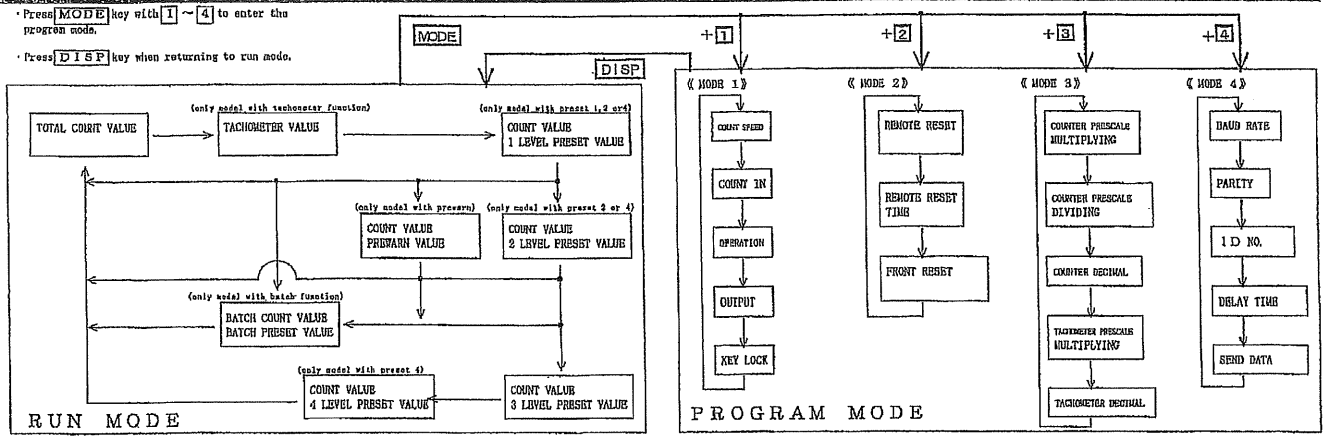
●MOUNTING
Insert the unit from front side of panel, and hang the nails of panel clamper on both side or upper-lower side of the unit, and fix the unit by fastening the screw.



《NOTE》
・The thickness of panel clamper is approx. 5mm. Make the enough space to arrange other unit on this panel.
・Avoid the excessive fastening for the screw of panel clamper.

RUN MODE AND PROGRAM MODE OPERATION

- Press [MODE] key with [1] ~ [4] to enter the program mode.
- Press [DISP] key when returning to run mode.



DETAILS OF PROGRAM MODE

NOTE : Depending on the models, programming items marked "※" do not apply to all models.

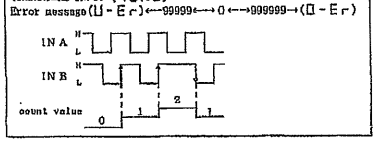
《 MODE 1》

●COUNT SPEED (C.SPd) MODE
Count speed can be selected from below.

30Hz	Lo.30
1kHz	Hi. 1
5kHz	Hi. 5
8kHz	Hi. 8

●COUNT IN (C.in) MODE
Count input method can be selected from below.

ADD INPUT (UP) ···IN A : ADD
(6 digits)write value→0→999999→error message (0-Er)
SUBTRACT INPUT (dn) ···IN A : SUB.
(6 digits)write value→0→-99999→error message (U-Er)
ADD/SUBTRACT INPUT (UPdn) ···IN A : ADD, IN B : SUB.
Error message(U-Er)←-99999←→0←→999999→(0-Er)
QUADRATURE INPUT (9uAd)
Error message(U-Er)←-99999←→0←→999999→(0-Er)



●OPERATION (C.AcE) MODE ※
Operation method can be selected from below.

OVER RUN	O.run
AUTO-RESET	A:rES
EQUAL ※	EQu.
UPPER/LOWER ※	UL.LL

UPPER/LOWER limit is not equipped for the model with prewarn.
EQUAL and UPPER/LOWER limit are not equipped for the model with batch.

●OUTPUT (Out 1~Out4) MODE ※
When OPERATION MODE is set to OVERRUN or AUTO-RESET, HOLD or ONE SHOT can be selected in OUTPUT MODE. When OPERATION MODE is EQUAL or UPPER/LOWER, HOLD is automatically set. Programming of OUTPUT MODE on each preset level is available.

HOLD	Hold	Hold at the preset value	Overrun / Auto-reset
ONE SHOT	OnE.S	Programming is available at time each is 10~990ms	Overrun / Auto-reset

・Refer to the following list of output corresponding to each model for the setting.

MODEL	OUT1	OUT2	OUT3	OUT4
G20-0□□□	OUT	—	—	—
1□□□	OUT1	OUT2	—	—
2□□□	PREWARN	OUT	—	—
3□□□	OUT	BATCH	—	—
4□□□	PREWARN	OUT	BATCH	—
5□□□	OUT1	OUT2	BATCH	—
6□□□	OUT1	OUT2	OUT3	OUT4

●KEY LOCK (OPEr : KEY OPERATION LOCK) MODE
Key operation to be abled or disabled can be selected.

	OPERATION, YES	OPERATION, NO
FRONT RESET	rES.y	rES.n
CHANGE ON PRESET VALUE	PrE.y	PrE.n
CHANGE ON CNT. ST. VAL. *	C.SE.y	C.SE.n
CHANGE ON MODE 1	PG1.y	PG1.n
CHANGE ON MODE 2	PG2.y	PG2.n
CHANGE ON MODE 3	PG3.y	PG3.n
CHANGE ON MODE 4	PG4.y	PG4.n

* CNT. ST. VAL. = COUNT START VALUE

《 MODE 2》

●REMOTE RESET (E.rES) MODE ※
Remote reset to be abled or disabled can be selected.

	RESET, YES	RESET, NO
PRESET COUNTER	PC y	PC n
BATCH COUNTER ※	bC y	bC n
TOTAL COUNTER	tC y	tC n

●REMOTE RESET TIME (rES.t) MODE
Either can be selected.

1ms	1
20ms	20

This time means minimum pulse time required for remote reset pulse.

《NOTE》
In the case of reseting remotely with contact input (relay, switch and so on), please select 20ms.

●FRONT RESET (F.rES) MODE ※
Front reset to be abled or disabled can be selected.

	RESET, YES	RESET, NO
PRESET COUNTER	PC y	PC n
BATCH COUNTER ※	bC y	bC n
TOTAL COUNTER	tC y	tC n

《 MODE 3》

●COUNTER PRESCALE(multiplying) (C.PS) MODE
Counter prescale can be selected from the 3 ranges as below.
0.001 ~ 999.999
0.0001 ~ 99.9999
0.00001 ~ 9.99999
Select the range by [ENT/UD] key.

●COUNTER PRESCALE(dividing) (C.di) MODE
Counter prescale can be set in following range.
1 ~ 9999

●COUNTER DECIMAL POINT POSITION (C.dP) MODE
Decimal point position for count values can be selected from below.

0.00000	0.00000
0.0000	0.0000
0.000	0.000
0.00	0.00
0.0	0.0
None	0

《NOTE》
If decimal point position is changed, the present preset value, count value, etc. are cleared.

●TACHOMETER PRESCALE(only multiplying) (t.PS) MODE ※
Only the model with tachometer is available to be set tachometer prescale as same as counter prescale.

●TACHOMETER DECIMAL POINT POSITIONING (t.dP) MODE ※
Decimal point position for tachometer value can be set as same as counter decimal point position.

《 MODE 4》

●BAUD RATE (bPS) MODE
Transmit speed can be selected from the below.

9600bps	9600
4800bps	4800
2400bps	2400
1200bps	1200
600bps	600
300bps	300

● PARITY BIT (P.bi t) MODE
Parity bit can be selected from the below.

non parity	NonE
even no. parity	EvEn
odd no. parity	Odd

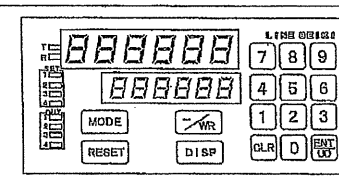
● ID NUMBER (id) MODE
ID number can be selected in the range of 00 ~ 99.

● DELAY TIME (dEL.t) MODE
Transmit delay time can be set from the below.

2ms	0.002
100ms	0.100

● SEND DATA (SEnd) MODE ※
Transmit data can be programmed on the following items.

	SEND	NOT SEND
PRESET COUNT VALUE	PC y	PC n
BATCH COUNT VALUE ※	bC y	bC n
TOTAL COUNT VALUE	tC y	tC n
1 LEVEL PRESET VALUE	P1 y	P1 n
2 LEVEL PRESET VALUE ※	P2 y	P2 n
3 LEVEL PRESET VALUE ※	P3 y	P3 n
4 LEVEL PRESET VALUE ※	P4 y	P4 n
PREWARN VALUE ※	Pn y	Pn n
BATCH PRESET VALUE ※	bP y	bP n

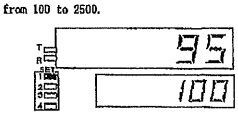


HOW TO PROGRAM PRESET VALUE

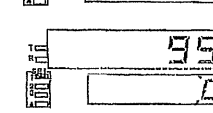
The preset value can be programmed in the RUN MODE.

EXAMPLE : Change of the preset value from 100 to 2500.

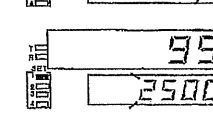
1) Press [DISP] key to display preset value. (SET 1 indicator lights)



2) Press [CLR] key. The number 0 on the lower display will blink.

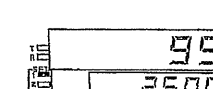


3). Set the preset value by using 0-9 numerical keys.



・For minus value input, press [-/WR] key first.
・Press [CLR] key to cancel the set value. In this case, the lower display shows previous preset value.

4) Press [ENT/UD] key to determine the preset value. (Blinking stops and the setting is completed)



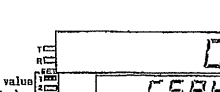
※How to set or change the preset value is all the same in any models.

HOW TO PROGRAM COUNT START VALUE

The count start value can be programmed in the RUN MODE.

1) Make preset count value show.

2) Press [-/WR] key to display count start value. (C.SEt is indicated on the lower display. The count start value is displayed on the upper display)



3) Press [CLR] key. 0 will be blink.

4) Set the count start value by using numerical keys.
・Press [-/WR] key first when the setting value is minus.
・Press [CLR] key to clear the set value. In this case, the lower display shows the previous value.

5) Press [ENT/UD] key to determine the count start value. (Blinking stop, and setting is completed)

6) Press [-/WR] key to make the display shows the preset count value.

7) By front key reset or remote reset on, the count start value can be shown on the upper display.

BATCH FUNCTION

MODEL G20-3□□□, 4□□□, 5□□□ have batch function.
G20-3□□□, 4□□□: One count is added when the counts reached to the 1 level preset value.
G20-5□□□: One count is added when the counts reached to the 2 level preset value.

OPERATION OF PROGRAM MODE

NOTE:Depending on the models, program items marked ※ do not apply to all models.
See the programming details of program mode and list of output.

MODE + 1

PROGRAM ITEM	UPPER DISPLAY	LOWER DISPLAY(PROGRAMMING DETAILS)	OPERATION
COUNT SPEED → MODE	C.SPd	Lo.30 → Hi.1 → Hi.5 → Hi.8	ENT/UD key to change the programming details.
COUNT IN → MODE	C.in	UP → do → UPdo → 9u3d	ENT/UD key to change the programming details.
OPERATION ※ → MODE	C.Act	0.run → A.rES → E9u. → UL.LL	ENT/UD key to change the programming details.
OUTPUT ※ → MODE	Out 1 ~ Out4 ※	◆When 0.run or A.rES selected: HoLd → OnE.S (Set one shot output pulse time for 10~9990(msec) when OnE.S is selected.)	ENT/UD key to change the programming details. (program on each level) Set one shot time by numerical keys.
		◆When UL.LL selected: UL → LL	ENT/UD key to select (UL) or (LL).
KEY LOCK → MODE	OPEr	rES.Y → rES.n (Reset key); PrE.Y → PrE.n (Preset value change); C.S2.Y → C.S2.n (Count start value change); PG1.Y → PG1.n (PROGRAM MODE 1 change); PG2.Y → PG2.n (PROGRAM MODE 2 change); PG3.Y → PG3.n (PROGRAM MODE 3 change); PG4.Y → PG4.n (PROGRAM MODE 4 change)	ENT/UD key to select yes(Y) or no(n).

MODE + 2

PROGRAM ITEM	UPPER DISPLAY	LOWER DISPLAY(PROGRAMMING DETAILS)	OPERATION
REMOTE RESET ※ → MODE	E.rES	PC Y → PC n (Preset counter); bC Y → bC n (Batch counter); tC Y → tC n (Total counter)	ENT/UD key to select yes(Y) or no(n).
REMOTE RESET TIME → MODE	rES.t	1 → 20	ENT/UD key to change the programming details.
FRONT RESET ※ → MODE	F.rES	PC Y → PC n (Preset counter); bC Y → bC n (Batch counter); tC Y → tC n (Total counter)	ENT/UD key to select yes(Y) or no(n).

MODE + 3

PROGRAM ITEM	UPPER DISPLAY	LOWER DISPLAY(PROGRAMMING DETAILS)	OPERATION
COUNTER PRESCALE (MULTIPLYING) → MODE	C.PS	0.001 ~ 999.999 ↓ 0.0001 ~ 99.9999 ↓ 0.00001 ~ 9.99999	ENT/UD key to change decimal point position. Enter prescale value by numerical keys.
COUNTER PRESCALE (DIVIDING) → MODE	C.di.u	1 ~ 9999	Enter prescale value by numerical keys.
COUNTER DECIMAL POINT → MODE	C.dP	0 → 0.0 → 0.00 → 0.000 → 0.0000 → 0.00000	ENT/UD key to change programing details.
TACHO.PRESCALE (MULTIPLYING) ※ → MODE	t.PS	0.001 ~ 999.999 ↓ 0.0001 ~ 99.9999 ↓ 0.00001 ~ 9.99999	ENT/UD key to change decimal point position. Enter prescale value by numerical keys.
TACHOMETER DECIMAL POINT ※ → MODE	t.dP	0 → 0.0 → 0.00 → 0.000 → 0.0000 → 0.00000	ENT/UD key to change programming details.

MODE + 4

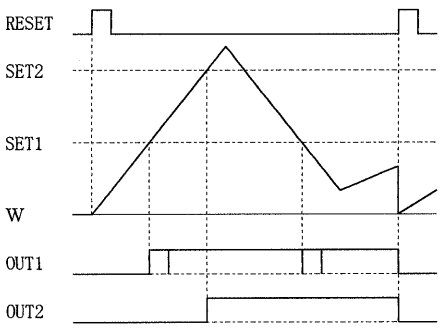
PROGRAM ITEM	UPPER DISPLAY	LOWER DISPLAY(PROGRAMMING DENIALS)	OPERATION
BAUD RATE → MODE	bPS	9600 → 4800 → 2400 → 1200 → 600 → 300	ENT/UD key to change the programming details.
PARITY BIT → MODE	P.bit	NonE → EuEn → Odd	ENT/UD key to change the programming details.
I D NO. → MODE	id	00 ~ 99	Enter I D No. by numerical keys.
DELAY TIME → MODE	dEL.t	0.002 → 0.100	ENT/UD key to change the programming details.
SEND DATA ※ → MODE	Snd	PC Y → PC n (Preset count value); bC Y → bC n (Batch count value); tC Y → tC n (Total count value); P1 Y → P1 n (1 level preset value); P2 Y → P2 n (2 level preset value); P3 Y → P3 n (3 level preset value); P4 Y → P4 n (4 level preset value); Pn Y → Pn n (Prewarn value); bP Y → bP n (Batch preset value)	ENT/UD key to select yes(Y) or no(n).

COUNT AND OUTPUT (1)

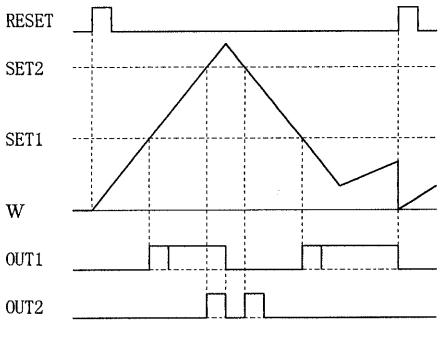
●G20−0□□□、1□□□、3□□□、5□□□、6□□□ (MODEL FOR 1 LEVEL, 2 LEVEL, 4 LEVEL or WITHOUT PREWARN)

・OVER RUN

OUT1 : ONE SHOT or HOLD
OUT2 : HOLD

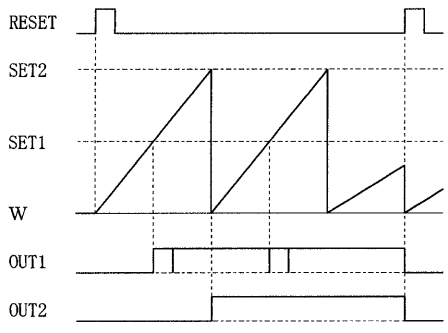


OUT1 : ONE SHOT or HOLD
OUT2 : ONE SHOT

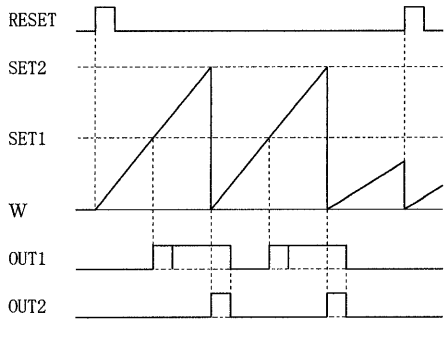


・AUTO-RESET

OUT1 : ONE SHOT or HOLD
OUT2 : HOLD



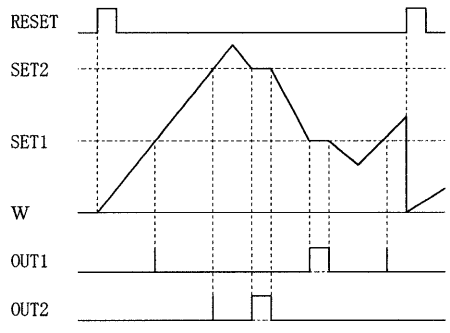
OUT1 : ONE SHOT or HOLD
OUT2 : ONE SHOT



・For 2 level or 4 level preset type, when output of the last preset level is set at ONE SHOT, all outputs are turned to OFF by the falling edge of ONE SHOT pulse.

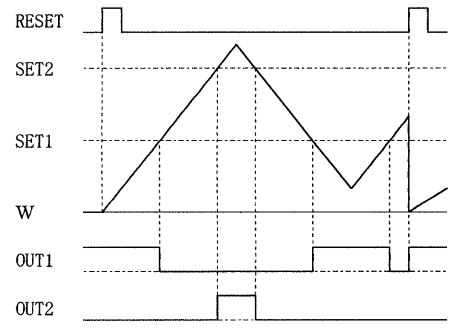
・EQUAL

Output is ON while the count value is equal to the counter preset value.



・UPPER/LOWER LIMIT

OUT1 : LL (LOWER LIMIT)
OUT2 : UL (UPPER LIMIT)

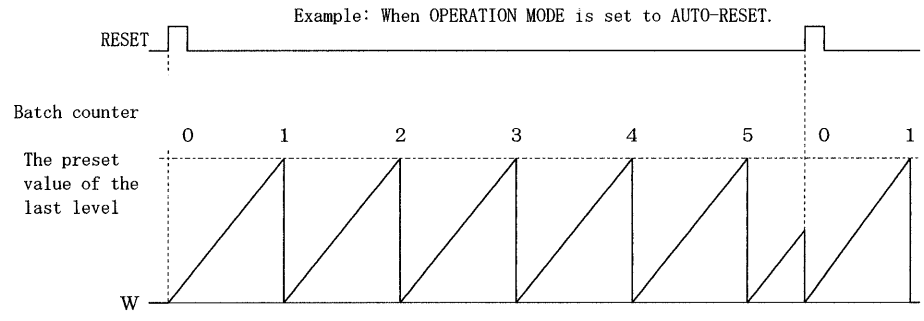


・Output of each preset levels is individual each other. Refer the above drawings.
EQUAL and UPPER/LOWER limit are not selectable on the model with Batch function.

●BATCH FUNCTION

G20− 3□□□、5□□□ have Batch function.
Batch counter counts 1 when the count value reaches to the preset value of the last level.

Example: When OPERATION MODE is set to AUTO-RESET.



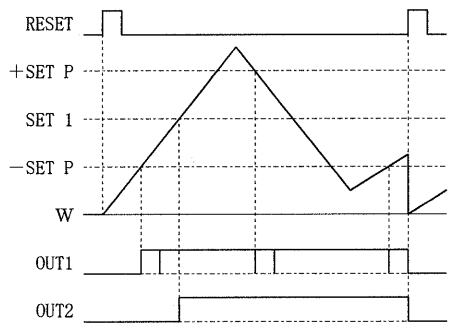
COUNT AND OUTPUT (2)

●G２０－２□□□、４□□□ (1 level with prewarn)

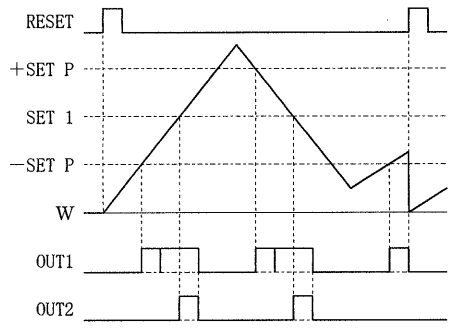
Model with prewarn has no UPPER/LOWER output in the OPERATION MODE. For G２０－４□□□, the model with batch function, EQUAL output is not available and only OVERRUN or AUTO-RESET is available in OPERATION MODE.
ＯＵＴ１ is prewarn output, ＯＵＴ２ is preset output. On the model with batch function, ＯＵＴ３ is batch output.

・OVER RUN

OUT1 (Prewarn output) : ONE SHOT or HOLD
OUT2 (Preset output) : HOLD

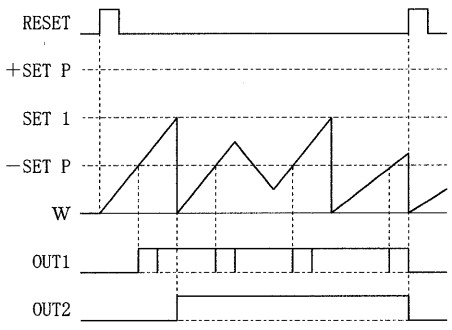


OUT1 (Prewarn output) : ONE SHOT or HOLD
OUT2 (Preset output) : ONE SHOT

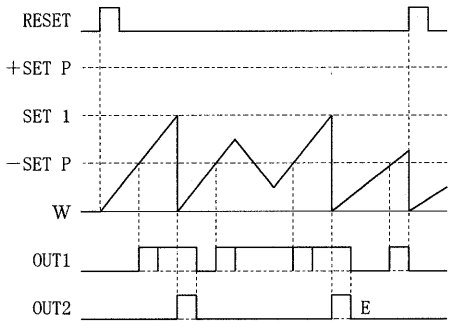


・AUTO RESET

OUT1 (PREWARN OUTPUT) : ONE SHOT or HOLD
OUT2 (PRESET OUTPUT) : HOLD

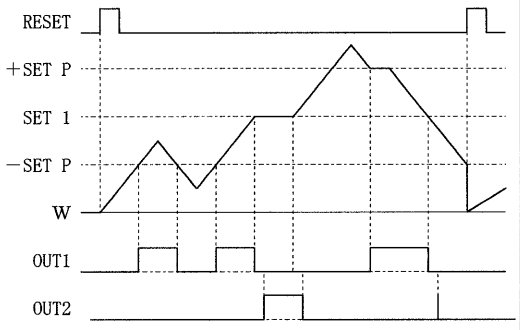


OUT1 (PREWARN OUTPUT) : ONE SHOT or HOLD
OUT2 (PRESET OUTPUT) : ONE SHOT



・When ＯＵＴ２ (Preset output) is set to ONE SHOT, ＯＵＴ１ (Prewarn Output) turns to be OFF by the falling edge of that ONE SHOT pulse.
・Prewarn output is ON only when the count value is near to ＳＥＴ１ (1 level preset value).

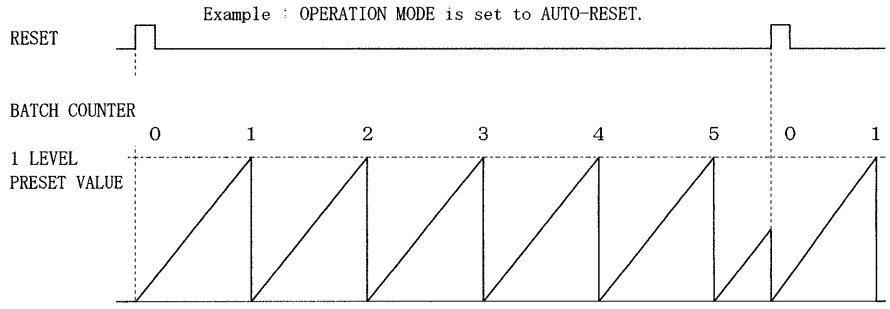
・EQUAL (Only for the model without batch function)
ＯＵＴ１ (Prewarn output) is ON only when the count value is near to ＳＥＴ１ (1 level preset value).
ＯＵＴ２ (Preset output) is ON only when the count value is equal to ＳＥＴ１.



●BATCH OUTPUT

Ｇ２０－ ４□□□ has Batch function.
Batch counter counts 1 when the preset counter reaches 1 level preset value. The batch output turns ON when the batch count reaches the batch preset value.
For the batch output, ONE SHOT or HOLD can be selected.

Example : OPERATION MODE is set to AUTO-RESET.



RESET

●Type of reset :
・Front reset
・Remote reset *
・Reset by serial communication command

* Does not count during shorting.

●Subject to be reset:
・Count value (Preset count value) and output
・Total count value
・Batch count value
・Error (Overflow , Underflow)

Reset able or disable are can be selected in the PROGRAM MODE.

Reset of count value (Preset count value) enables all preset outputs to be OFF.

●The determined count start value can be shown on the upper display by reset ON.
The count start value at ex-fact is set to 0.

SERIAL COMMUNICATION (1)

●The control uses ASCII code with the RS-485 serial specification.
●This allows bi-directional communications and addressing of multiple controls on a single two-wire communication bus.
●Each unit is individually addressed via a user programmable ID number. Up to 32 G20 counters can be connected directly to the bus.

※SERIAL COMMAND SUMMARY

RDD	:	Read count value/preset value. (display only)
RDI	:	〃 (value of integral number)
RDU	:	〃 (value of under decimal point)
WRD	:	Write preset value.
RES	:	Reset for count value and condition of over/under flow error.
RDO	:	Read output condition.
STP	:	Count prohibition.
RSM	:	Cancellation for count prohibition.
LTD	:	Store count value/preset value in memory of counter.
RLD	:	Read stored data by LTD command.

《NOTE》
・It can not be to communicate if the count input pulse speed goes over the max. count speed.
・Use only the character of capital letter in communication.

◆ TRANSMISSION FORMAT

The general command is shown below. Spaces are used for clarify only and must not be transmitted.

＞ＩＤ# COMMAND (numerical data) CHECKSUM (ｃｒ)

Example: To cause the unit #10 to transmit the value of main counter, send the RDD command as follows.

＞	１０	RDD	PC	CE	(ｃｒ)
①	②	③	④	⑤	⑥

① Message start character (ＡＳＣＩＩ ６２). Required for all transmission to the control.

② Two digits serial port ID# in decimal. Required for all transmission to the control.
Unit ID#１０ (decimal) is unit ＩＤ#０Ａ (hexadecimal) , capital letters must be used.

③ RDD command. All serial commands consist of three characters.

④ Sub command decides the details for serial command. This command means the read of preset count value by PC.

⑤ Checksum.

CHECK SUM CALCULATION

1	0	R	D	D	P	C

４９＋４８＋８２＋６８＋６８＋８０＋６７ ＝ ４６２ (Dec.)
＝ １ＣＥ (Hex.)

Check sum is the last two hexadecimal charring.
The ＞ start character and carriage return (ｃｒ) are not used in calculation.

⑥ ＡＳＣＩＩ carriage return (13 decimal) . Required at the end of all commands.

◆ RESPONSE FORMAT

RESPONSE RECOGNITION FORMAT

The counter does not respond to a command unless the transmitted ID number matches its programmed ID number.
If the ID numbers match and the command and checksum are valid, the control executes the command and transmits a response as shown below.

[Ａ] [ＤＡＴＡ] [ＣＨＥＣＫ ＳＵＭ] (ｃｒ)

[Ａ] is the acknowledge character sent when any valid command is received and executed.

[ＤＡＴＡ] is sent in response to request data.

[ＣＨＥＣＫ ＳＵＭ] is sent only when data is requested (RDD, RDI or RDU commands).
The checksum is calculated by adding the ASCII values of all preceding characters (including the "A" and spaces). The checksum is the two least significant digits of. this sum in hexadecimal.
(ｃｒ) is the ＡＳＣＩＩ carriage return (13 decimal). Transmitted at the end of all responses

Ex１ : Ａ (ｃｒ) = No data requested.
Ex２ : ＡＰＣ １２３４５６ ４８ (ｃｒ) = Count data requested.

ERROR RESPONSE FORMAT

If the ID numbers match but the command is not valid or cannot be executed, the counter ignores the command and responds by sending an ASCII "N" (not acknowledged), followed by one character and carriage return.

※ERROR CODES

ＮＯ２ : CHECKSUM ERROR
Received checksum does not match the calculated check sum.

ＮＯ５ : INVALID DATA
Incorrect number of digit or illegal characters received in data field.

Ｎ１１ : RESET EDIT IN PROGRESS ON KEY BOARD
Serial preset cannot be sent if the preset is being changed on the key board.

Ｎ１３ : KEY BOARD PROGRAM MODE IS ACTIVE
Cannot enter serial the PROGRAM MODE if in the key board PROGRAM MODE.

ＮＦＦ : UNDER OVERFLOW or UNDERFLOW FOR COUNT VALUE
It is impossible to communicate under displaying for overflow error or underflow error.
It is possible to communicate by reset command for error cancellation as the exception.

EX１ : ＮＯ５ (ｃｒ) = Invalid data

◆ RS-485 SERIAL INTERFACE

WAY OF COMMUNICATION	Half duplex, Asynchronous
FORMAT	ＡＳＣＩＩ code Start bit 1 bit Data bit 8 bit ~~(including parity bit)~~ Stop bit 1 bit Parity bit 1 bit
BAUD RATE	３００／６００／１２００／２４００／４８００／９６００ bps (Selection)
PARITY	NON/ODD/EVEN (Selection)

♦EXPLATION FOR COMMUNICATION COMMAND

1. RDD (XX) : Read Count value / Preset value

●This requires sub command with two(2) figures(XX). In accordance with required data, sub command is decided.
●The response are shown as [sub command] [data] [check sum] [Cr] in order.
●The decimal point positioning is also shown the same as the display of counter in this response.
●The zero [0] in needless is read as a space.

Example for read : >01RDDPCCB(cr) = Read preset count value in unit No. 01.

Example for answer: APC -123.46 4D(cr) = preset count value -123.46.

Communication sub command. (XX)	Contents of command	
PC	Preset count value	
BC	Batch count value	※ Communication sub command is different according to each models
TC	Total count value	
TM	Tachometer value	
P1	1 level preset value	
P2	2 level preset value	
P3	3 level preset value	
P4	4 level preset value	
PW	Prewarn value	
BP	Batch preset value	
SO	Item selected for SEND DATA in the PROGRAM MODE	

2. RDI (XX) : Read Count value/Tachometer value(the value of integral)

3. RDU (XX) : Read Count value/Tachometer value(the value of under decimal point).

●This command works the same as RDD command. Only 3 kind of sub command as shown below are available.
●RDI is the command to read the value of integral part in count value or tachometer value.
●RDU is the command to read the value under the decimal point in count value or tachometer value.

Example for send : >10RDUPCDF(cr) = Read the preset count value in unit No. 10.

Example for response : APC. 12000000 64(cr) = Preset count value(under the decimal point): 12.

Communication sub command. (XX)	Contents of command
PC	Preset count value
TC	Total count value
TM	Tachometer value

4. WRD (XX) : Set the preset value.

●This requires sub command with 2(two) figures (XX). In accordance with the contents of command, sub command is decided as shown below.
●The response is [A] (cr) only.
●The decimal point position can not be set by WRD command. The decimal point is shown at the the position set in the program mode.

Example for send : >10WRDP10D1234F9(cr) = set 1 level preset value in the unit No. (ID No.)10.

Communication sub command. (XX)	Contents of command	
P1	1 level preset value	
P2	2 level preset value	※ Communication sub command is different according to each models.
P3	3 level preset value	
P4	4 level preset value	
PW	Prewarn value	
BP	Batch preset value	

5. RES (XX) : Reset

●This requires sub command with two(2) figures (XX). In accordance with the contents of command the sub command is decided as shown below.
●The response is [A] (cr) only.
●This command works same as front reset key operation or reset input.

Example for send:>00RESPCDD(cr) = Reset preset count value in unit No. (ID No.)00.

Communication sub command. (XX)	Contents of command	
PC	Preset count value	※ Communication sub command is different according to each models.
BC	Batch preset value	
TC	Total count value	
ER	Cancelling for error condition(over, under flow)	

6. RDO : Read output condition (respective condition in out 1 ~ out 4)

●The response is shown [A] [OUT 1 (HorL)] ~ [OUT 4 (HorL)] [Check sum)] (cr) in order.

Example for send: >00RDO45(cr) = Read output condition in unit No. 00.

Example for response: A1L2H3L4LP6(cr) = The output condition are as shown below in this example for response.

※OUT1~OUT4 is different according to each models.

1L	OUT1 → Low
2H	OUT2 → Hi
3L	OUT3 → Low
4L	OUT4 → Low

7. STP : Count prohibition
8. RSM : Cancellation for count prohibition

●When STP command is sent to the counter, counter does not enter any count input pulse until the counter received RSM command.
●Count prohibition will be cancelled when the power supply of counter is cut off. When the power supply of counter turns on, counter begins to accept the input pulse.
●The response is [A] (cr) only.

Example for send: >00STP57(cr) = Count prohibition in unit No. 00.
>00RSM52(cr) = Cancellation for count prohibition in unit No. 00.

9. LTD (XX) : Store count value, tachometer value or preset value in the memory

●This requires sub command with two(2) figures. In accordance with the contents of command, sub command is decided as shown below.
●The data which can be memorized by this command is only one (1)item per once. In case this command is carried out newly, new data will be memorized instead of previous data.
●The response is [A] (cr) only.
●When the power supply of counter is cut off, the memorized data will be deleted.

Example for send: >00LTDPCD7(cr) = Store preset count value of unit No. 00. in its memory

Communication sub command (XX)	Contents of command	
PC	Preset count value	
BC	Batch count value	※ Communication command is different according to each models.
TC	Total count value	
TM	Tachometer value	
P1	1 level preset value	
P2	2 level preset value	
P3	3 level preset value	
P4	4 level preset value	
PW	Prewarn value	
BP	Batch preset value	

10. RLD : Read the data stored by LTD command

●The response is shown as [sub command][data][check sum][cr] in order.
●In this response, the decimal point position showed on the display is also sent.
●The zero [0] in needless are sent as a space.
●If the RLD command is carried out before the data is stored by LTD command, the response will be error code.

Example for send: >00RLD42(cr) = Read the stored data of unit No(ID No.) 00 in its memory.

Example for response: APC -123.45 4D(cr) = Preset count value -123.45.

♦EASY COMMUNICATION (COMMUNICATION REQUEST)

●Easy communication (Communication request)
For the way of easy communication, there is the function named communication request in this counter. By shorting the terminal of "communication request" and "GND", it reads the data set for SEND DATA in the program mode.

Example for set : When the data of the preset count value and 1 level preset value are set for SEND DATA in the PROGRAM MODE.

Example for response: APC 123.00 P1 200.00 58(cr)
The above example shows : Preset count value is 123.00
1 level preset value is 200.00

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