

DESCRIPTION

The CS2-TM(Pulse Input) is innovation totalizer.

- Adtek builds in high technology with wide input range from 0.01Hz~ 140.00KHz with auto-range function at same unit. There are three setting modes for K factor, 1/K factor and flow speed to match the difference output description of flow-meters.

The Totalizer provides high accuracy measurement, display, control and communication (Modbus RTU mode) of Pulse from flowmeter or encoder, proximity switch, photo switch for length control.

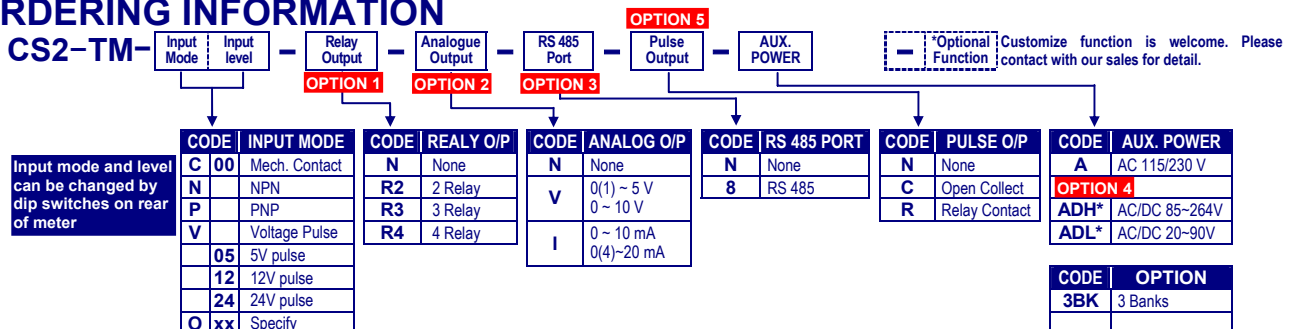
There are two display screen and 3 external control input (DI) in standard and the optional 4 Relay, 1 Analogue, 1 Pulse and RS485 port available. They are also support fantastic control function as like as N, C, R mode for totalizer and batch control.



FEATURE

- Measuring Pulse **AUTO RANGE** 0.01Hz~100KHz(optional:140KHz); Contact / NPN / PNP / Voltage Pulse can be switch on rear of meter
- Accuracy of immediate Value: $\pm 0.005\%$; Decimal Point auto moving according to input frequency
- Dual display screen for 10 digital Totalizer or Batch counter + 4 2/3 Immediate Value(PV) or 6 digital Batch programmable.
- 4 banks pre-set for all relay functions relative 4 difference scaling, and selectable by 3 External Control Inputs(E.C.I.) or front key in optional
- 4 relay can be individual programmed to relative immediate value(PV) or totalizer / batch / batch counter.
 - Relative to Immediate Value(PV): Functions settable Energized Mode Hi / Lo / Hi(Lo) Hold / DO / Go, Hysteresys, Energized Delay, De-energized Delay, Energized latch or Energized by RS485 command.
 - Relative to Totalizer / Batch / Batch Counter: N/C/R mode and energized time programmable.
- 3 external control input can be individual programmed for immediate value(PV) or totalizer / batch / batch counter.
 - Immediate Value(PV): PV Hold / Reset for Maximum or Minimum Hold / DI / Reset for Relay Energized Latch
 - Totalizer / Batch / Batch Counter: Reset, Gate
- Analogue Output and Pulse Output available in option
- RS485(Modbus RTU mode), Baud Rate is up to 38400bps
- Comply to CE standard & RoHS

ORDERING INFORMATION



TECHNICAL SPECIFICATION

Input Frequency	Input Mode	Input Level
0.01Hz ~ 50 Hz	Contact	
0.01Hz ~ 50 Hz	NPN	High Level: 8~12V; Low Level: 0.0~4.0 V (with excitation supply 12Vdc)
0.01Hz ~ 100KHz	PNP	
0.01Hz ~ 140KHz (optional)	Voltage Pulse	High Level: over 2/3 of input level Low Level: under 1/3 of input level

> Input Mode(NPN, PNP, Contact) & Level(5Vp, 12Vp, 24Vp) changeable by dip switch of rear terminal block.

Calibration:

Input range:

Accuracy:

Sampling time:

Response time:

Time out function:

Display & Functions

LED:

Doesn't need calibration

Auto range: 0.01Hz ~ 100KHz (~140KHz in option);

$\leq \pm 0.005\%$ of FS $\pm 1C$;

10 cycles/sec($\geq 10Hz$);

f cycles/sec($\leq 10Hz$)

≤ 100 msec(when the AvG = "1")

Auto, Manual programmable, In manual mode, the period of time out can be set 0.0 sec~999.9sec

Up screen: 10 digits, 0.28" red high-brightness LED

Down screen: 6 digits, 0.28" red high-brightness LED

Relay output indication: 4 square red LED
 RS 485 communication: 1 square orange LED
 E.C.I. function indication: 3 square green LED
 Max/Mini Hold indication: 2 square orange LED

Up screen selection: Up screen can be programmed to show
 or Batch Counter(10 digits)

Down screen selection: Down screen can be programmed to show
 Batch(6 digits) or Immediate Value(5 digits)

Display range: Immediate Value(PV): 0~99999;
 Batch: 0~999999
 Totalizer / Batch Counter: 0~999999999

For Immediate Value(PV)

Time unit(Flow/T unit): Per Second / Minute / Hour programmable
Resolution of PV: Decimal point will Auto-changed according to input

(Auto-Moving for d.p.) Auto / Semi-Auto / Fix; 3 mode programmable

Over range indication: ovFL, when input is over 120% of input range Hi

Max / Mini recording: Maxi & Mini Value of PV storage during power on.

Display functions: PV / Max(Mini) Hold / RS 485 / Batch
 Programmable for down screen.

Factor setting: there are 3 parameter modes can be set
Pulse/Flow-unit(K factor): settable range: 0.0001~99999
Flow/Pulse (1/K factor): settable range: 0.0001~99999
Valume/Hz with diameter of pipe:
 Diameter settable range: 0.0001~99999
 Valume/Hz(Flow rate) settable : 0.0001~99999

Low cut: Settable range: -19999~29999 counts
Digital fine adjust: Pv.Zro: Settable range: -19999~+29999
 Pv.SPn: Settable range: -19999~+29999

For Totalizer / Batch / Batch Counter

Decimal point: Settable: 0 / 0.0 / 0.000 / 0.000 / 0.0000

Over flow indication: ovFL / Re-cycle counting programmable

Reading Stable Function

Average: Settable range: 1~99 times
Digital filter: Settable range: 0(None)/1~99 times

Control Functions(option)

Set-points: Four set-points
Control relay: Four relays
 Relay 2 & Relay 3: Dual FORM-C, 5A/230Vac, 10A/115V
 Relay 1 & Relay 4: Dual FORM-A, 1A/230Vac, 3A/115V

Banks pre-set: 4 banks pre-set for all relay functions to relative 4
 difference scaling, and selectable by 3 External
 Control Inputs(E.C.I.) Or front key

Relay energized mode: multi-cross selection for immediate Value(PV), batch,
 batch counter and totalizer.

For Immediate Value(PV)

Energized mode: Energized levels compare with set-points:
 Hi / Lo / Go.12 / Go.23 / Hi.HLd / Lo.HLd; programmable

DO function: Energized by RS485 command of master.

D.P. of Set Point: 0 / 0.0 / 0.00 / 0.000 / 0.0000

Energizing functions: Start delay / Energized & De-energized delay / Hysteresis
 Energized Latch

Start band(Minimum level for Energizing): 0~9999counts

Start delay time: 0:00.0~9(Minutes):59.9(Second)

Energized delay time: 0:00.0~9(Minutes):59.9(Second)

De-energized delay time:
 Hysteresis: 0~5000 counts

For Totalizer / Batch / Batch Counter

Energized mode: N / R / C Mode
 Period of Relay on: 0:00.0~9(Minutes):59.9(Second)

External Control Inputs(ECI)

Input mode: 3 ECI points, Contact or open collect input, Level trigger
Functions: multi-cross selection for immediate Value(PV), batch,
 batch counter and totalizer.

Debouncing time: Settable range 5 ~255 x (12mseconds)

For Immediate Value(PV)

Functions: Relative PV(Tare) / PV Hold / Reset Max or Mini. Hold / DI /
 Reset for Relay Energized latch / Banks selection
 programmable

For Totalizer / Batch / Batch Counter

Functions: Gate for Totalizer and(or) Batch(Batch Counter) / Reset
 for Gate for Totalizer and(or) Batch(Batch Counter)
 programmable

Analogue output(option)

Accuracy: $\leq \pm 0.1\%$ of F.S.; 16 bits DA converter
Ripple: $\leq \pm 0.1\%$ of F.S.
Response time: ≤ 100 msec. (10~90% of input)
Isolation: AC 2.0 KV between input and output
Output range: Specify either Voltage or Current output in ordering
 Voltage: 0~5V / 0~10V / 1~5V programmable
 Current: 0~10mA / 0~20mA / 4~20mA programmable
Output capability: Voltage: 0~10V: $\geq 1000\Omega$;
 Current: 4(0)~20mA: $\leq 600\Omega$ max
Functions: Relative to immediate value(PV), totalizer, batch or
 batch count programmable
Ao.HS(output range high): Settable range: -19999~29999
Ao.LS(output range Low): Settable range: -19999~29999
Ao.LM(output High Limit): 0.00~110.00% of output High
Ao.Zro: Settable range: -38011~+27524
Ao.SPn: Settable range: -38011~+27524

Pulse output(option)

Output mode: Open collect: 30V/60mA or Relay: DC24V/1A
Output vs. parameter: Relative to totalizer, batch or batch count programmable
Output range: 1000Hz max. duty cycle 50%
Pulse divider: Settable range from 1~9999.

RS 485 Communication(option)

Protocol: Modbus RTU mode
Baud rate: 1200/2400/4800/9600/19200/38400 programmable
Data bits: 8 bits
Parity: Even, odd or none (with 1 or 2 stop bit) programmable
Address: 1 ~ 255 programmable
Remote display: to show the value from RS485 command of master
Distance: 1200M
Terminate resistor: 150 Ω at last unit.

Electrical Safety

Dielectric strength: AC 2.0 KV for 1 min, Between Power / Input / Output / Case
Insulation resistance: $\geq 100M$ ohm at 500Vdc, Between Power / Input / Output
Isolation: Between Power / Input / Relay / Analogue / RS485 / E.C.I.
EMC: EN 55011:2002; EN 61326:2003
Safety(LVD): EN 61010-1:2001

Environmental

Operating temp.: 0~60 °C
Operating humidity: 20~95 %RH, Non-condensing
Temp. coefficient: ≤ 100 PPM/°C
Storage temp.: -10~70 °C
Enclosure: Front panel: IEC 549 (IP54); Housing: IP20

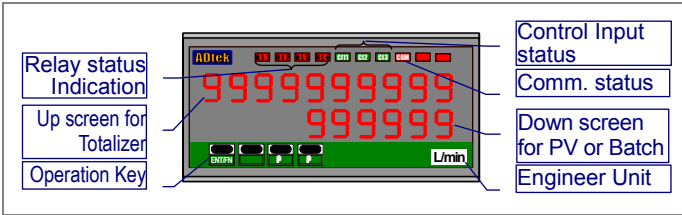
Mechanical

Dimensions: 96mm(W) x 48mm(H) x 120mm(D)
Panel cutout: 92mm(W) x 44mm(H)
Case materiel: ABS fire-resistance (UL 94V-0)
Mounting: Panel flush mounting
Terminal block: Plastic NYLON 66 (UL 94V-0)
 10A 300Vac, M2.6, 1.3~2.0mm²(16~12AWG)
 550g / 350g(Aux. Power Code: ADH or ADL)

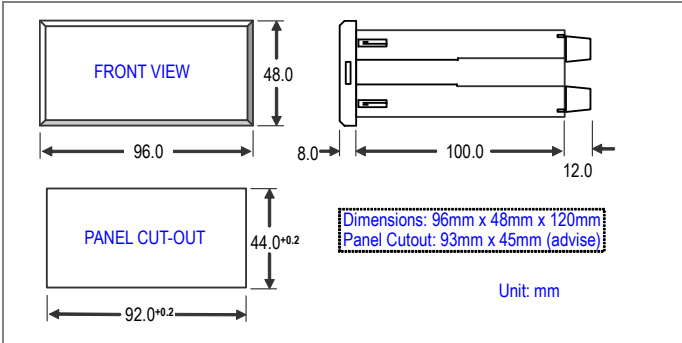
Power

Power supply: AC115/230V,50/60Hz;
Optional: AC/DC 85~264V or 20~90V(RoHS version)
Excitation supply: DC12V, 24V/30mA maximum
Power consumption: 5.0VA maximum
Back up memory: By EEPROM

FRONT PANEL

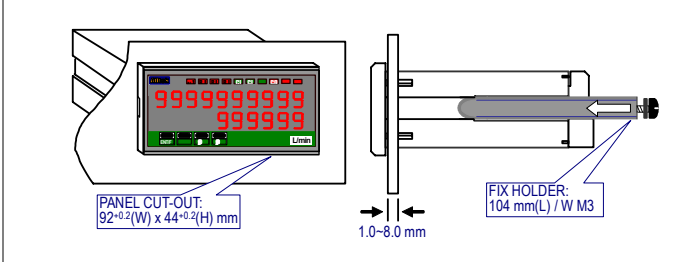


DIMENSIONS

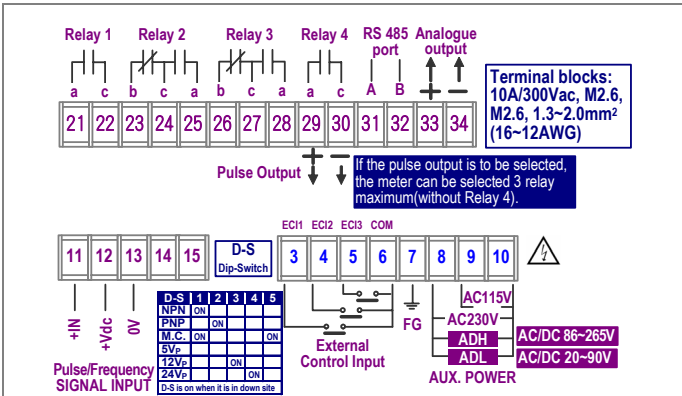


INSTALLATION

The meter should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation.

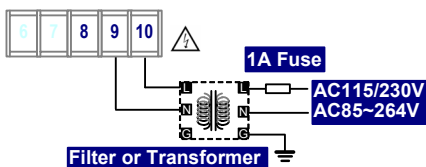


CONNECTION DIAGRAM

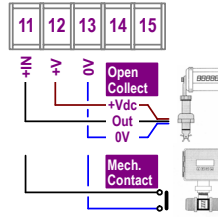


Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply



Input connection

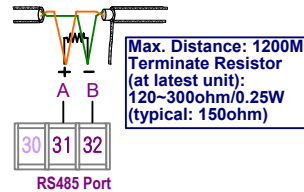


Please change the dip-switch on rear of meter to match the input mode and level.

D-S	1	2	3	4	5
NPN	ON				
PNP		ON			
M.C.	ON				ON
5V _P					
12V _P			ON		
24V _P				ON	

D-S is on when it is in down site

RS485 Communication Port



FUNCTION DESCRIPTION

Input Functions

Input range:

The meter has been designed very wide input range from 0.01Hz~100.00KHz (Option: 0.01Hz~140.00KHz) that can cover almost any application for X Rotor flow meter. User doesn't need to specify the input range.

Auto range display:

programmable between Auto Range / Semi-Auto Range / manual range. The description as below,

Auto range [Auto]: The decimal point will be auto changed according to the input frequency so that keep in the highest resolution.

Semi-Auto range [SEMI]: The decimal point will be auto changed according to the input frequency to keep reading in the highest resolution under setting position of decimal point.

according to the setting of decimal point. So, it's possible to show "overflow", if the input frequency is over the display range.

Manual range [MANUL]: The decimal point will be fixed

Time out of input:

In the case of low frequency, the meter can not to identify that is low frequency and no input until the next pulse input. Sometimes, it takes a long period.

The meter builds in a time out function to cut out the reading to be "0". There are two modes [MANUL] / [Auto] can be programmed.

Manual [MANUL]: There is a period named [ito] can be set from 0.0 sec~999.9sec. The reading will display "0", when the next pulse doesn't input during the setting time.

Auto range [Auto]: The reading will display "0", when the pulse doesn't input during the time that gave by formula of meter's firmware.

Period of time out:

Settable: 0.0 sec~999.9sec

If the time out mode [ito.Md] set to be [MANUL], ito will be show out.

Display & Functions

Dual display screens:

Down screen can be Immediate Value(PV) and Batch programmable; Up screen can be Totalizer and Batch counter programmable.

For Immediate Value(PV)

Three setting modes for flow meters:

There are three types setting for **Pulse/Flow-unit(K factor)**, **Flow/Pulse(1/K factor)** and **Flow rate/Hz** to match the difference output description of flow meters. Engineer needs just to check the mode of flowmeter and setting. The totalizer will calculating the flow rate, and accumulation.

Remark: A K-Factor is the number of pulses a sensor will generate for each engineering unit of fluid which passes the sensor.

Pulse/Flow-unit (K factor):

- **The decimal point of K Factor:** Settable range from 0 to 0.0000.
- **Pulse/Flow-unit(K factor):** Settable range from 0.0001 to 99999
Ex. A rotor X sensor fit in 4" pipe. The K Factor is 5.2417Pulse/Liter

Please select **PLS/F** in function **[F.tYP]**, set the **[F.dP]** to **0.0000**, and **[PLS/F]** to **5.2417**. The meter will calculate and show the right measuring(Immediate value).

Flow/Pulse (1/K factor):

- **The decimal point of 1/K Factor:** Settable range from 0 to 0.0000.
- **Flow/Pulse(1/K factor):** Settable range from 0.0001 to 99999
Ex. A rotor X sensor fit in 4" pipe. The 1/K Factor is 1.2345Liter/Pulse
Please select **PLS/F** in function **[F.tYP]**, set the **[F.dP]** to **0.0000**, and **[PLS/F]** to **5.2417**. The meter will calculate and show the right measuring(Immediate value).

Valume/Hz:

- **The decimal point of pipe's diameter:** Settable range from 0 to 0.0000.
- **Diameter of pipe:** Settable range from 0 to 0.0000(Unit)
- **The decimal point of flow rate (Length/sec):** Settable range from 0 to 0.0000.
- **Flow Rate:** Settable range from 0.0001 to 99999(Unit)

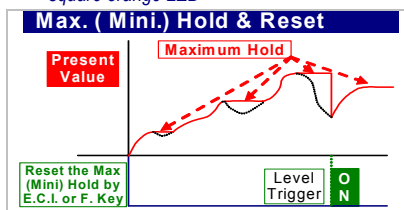
Max / Mini recording: The meter will storage the maximum and minimum value in **[User Level]** during power on in order to review drifting of PV.

Display functions: **PV / Max(Mini) Hold / RS 485 programmable in [dSPly] function of [inPUt GroUP]**
(Please refer to step A-11)

Present Value [PV] (Immediate value): The display will show the value that Relative to Input signal.

Maximum Hold [Max.H] / Minimum Hold [Mini.H]:
The meter will keep display in maximum(minimum) value during power on, until manual reset by front key in **[User Level]**, rear terminal is close **[External Control Input(E.C.I.)]** or press front down or up key to reset (according to setting, please functions of refer to the ECI Group)

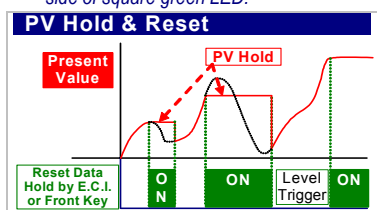
- Please find the **[M.H]** sticker that enclosure the package of the meter to stick on the right side of square orange LED



Remote Display by RS485 command [RS485]: The meter will show the value in down screen that received from RS485 command sending value. The up screen, control function, analogue output,.. will work and action according to the value.

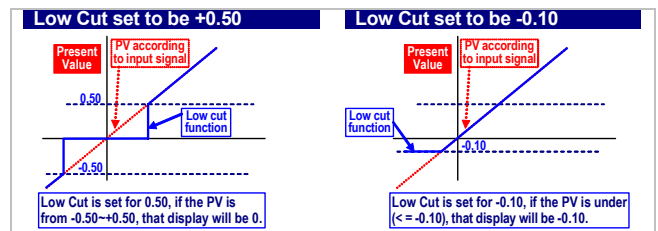
PV Hold [Pv. HLd]: **[External Control Input(E.C.I.)]** can be set to be **[Pv. HLd]** function(Please refer to the function of ECI Group). The display will be hold, when the E.C.I. is closed.

- Please find the **[ECI PV]** sticker to stick on the right side of square green LED.



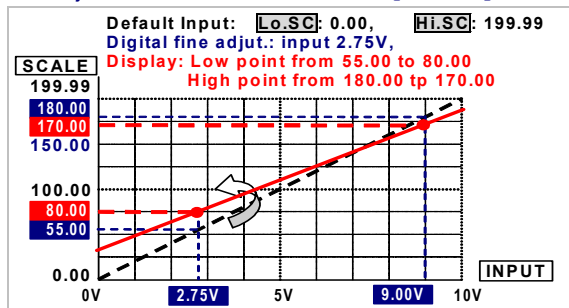
Low cut:

If the setting value is positive, it means when the absolutely value of $PV \leq$ Setting value, the display will be 0. If the setting value is negative, it means when the PV under setting value ($PV \leq$ -Setting value), the display will be setting value.



Digital fine adjustment:

Users can get Fine Adjustment for Zero & Span of PV by front key of the meter, and "Just Key In" the value which user want to show in the current input signals. Especially, the **[Pv.Zro]** & **[Pv.SPn]** are not only in zero & span of PV, but also any lower point for **[Pv.Zro]** & higher point for **[Pv.SPn]**. The meter will be linearization for full scale. The adjustment can be clear in function **[Z.S.Clr]**.



For Totalizer / Batch / Batch Counter

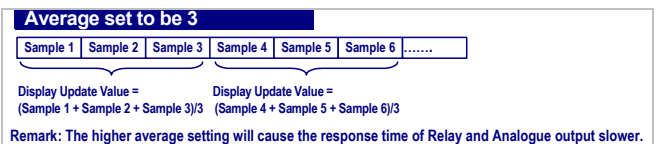
Over flow indication: ovFL / Re-cycle counting programmable

The up screen will show the **ovFL**, if the **[oFL.Md]** set to be **ovFL**. And it will re-counting from "0", if the **[oFL.Md]** set to be **FCYCL**.

Reading Stable Function

Average:

Basically, the sampling rate of meter is 15cycles/sec. If the function set to be 3 times, It means the meter will update of display will be 5 times/sec.



Remark: The higher average setting will cause the response time of Relay and Analogue output slower.

Digital filter:

The digital filter can reduce the magnetic noise in field.

Control Functions(option)

Multi-Cross function selection

4 relay can be programmable to relative Totalizer, Batch, Batch Counter and Immediate Value(PV) with individual functions.

For Immediate Value(PV)

Relay energized mode: Hi/Lo/Go-1.2/Go-2.3/Hi.HLd/Lo.HLd/do programmable

Hi: Relay will energize when $PV >$ Set-Point

Lo: Relay will energize when $PV <$ Set-Point

Go-1.2: This function is programmable in Relay 4 only.

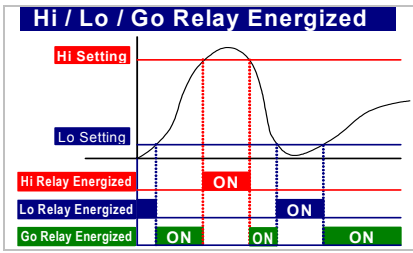
If the Relay 4 set to be Go function, the relay will compare with **[rY1.SP]** and **[rY2.SP]**.

Go relay energized when the condition is **[rY1.SP] (Hi) > PV > [rY2.SP] (Lo)**

Go-2.3: This function is programmable in Relay 4 only.

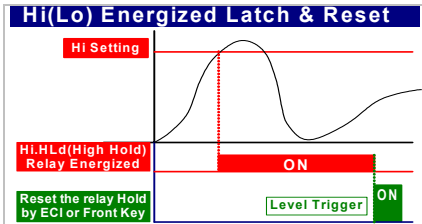
If the Relay 4 set to be Go function, the relay will compare with **[rY2.SP]** and **[rY3.SP]**.

Go relay energized when the condition is **[rY2.SP] (Hi) > PV > [rY3.SP] (Lo)**



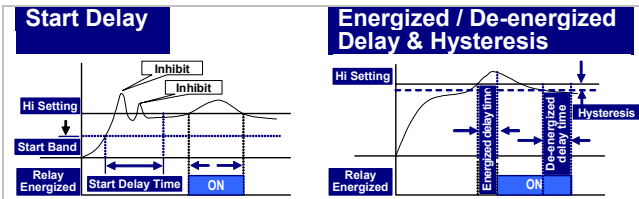
Hi.HLd (Lo.HLd): When the PV is Higher (or lower) than set-point, the relay will be energized and latch until manual reset by front key in [User Level] ,

[External Control Input(E.C.I.)] is closed or Press front down or up key to reset (UP Key or Down Key functions have been set to be "YES").



DO function: Energized by RS485 command of master. The function was designed to get remote control by RS485 command of master. The typical application is to control a switch in field from computer center as like as digital output(DO) of PLC.

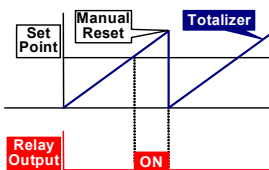
Energized functions: Start delay / Energized & De-energized delay / Hysteresis



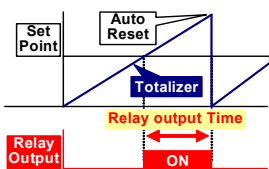
For Totalizer / Batch / Batch Counter

Relay energized mode:

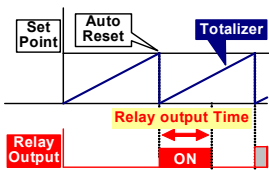
The 3 mode are very useful idea to control the totalizer, batch and batch counter. The relay energized condition is according to not only energized level, but also time and reset for totalizer, batch and batch counter.



N MODE:
When the condition of Set Point is met:
1. the relay will be energized;
2. The totalizer will run as same as usual; until manual reset by front key or by rear terminal, the totalizer will be reset to "0" and the relay will be de-energized.



R MODE:
When the condition of Set Point is met:
1. The relay will be energized; until the time is over Relay output time **[rY.1(2).ot]** (Relay1(2) output time).
2. The totalizer will run as same as usual; until the time is over Relay output time **[rY.1(2).ot]** (Relay1(2) output time), The totalizer will be reset to "0".



C MODE:
When the condition of Set Point is met:
1. The relay will be energized; until the time is over Relay output time **[rY.1.ot]** or **[rY.2.ot]**.
2. The totalizer will be reset to "0", then counts-up from "0".

External Control Inputs(ECI)

The three external control inputs are individually programmable to perform specific meter control or display functions. All E.C.I. have been designed in level trigger actions. Please pay attention, the EC1 or EC12 input will be disable while UP or Down Key has been set to be "YES".

Debouncing time:

The function is for avoiding noise signal to into the meter. And The basic period is 8m seconds. It means you set the number that has to multiple 8m seconds.

For example:

[**dEbnC**] set to be 5, it means 5 x 8m seconds = 40m seconds

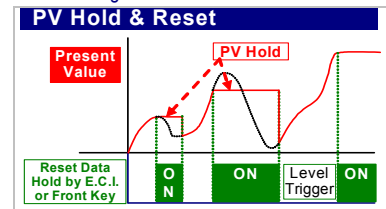
For Immediate Value(PV)

Functions:

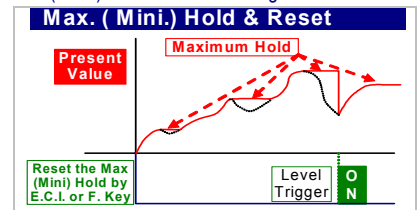
Relative PV / PV Hold / Reset Max or Mini. Hold / DI / Reset for Relay Energized latch / Banks selection programmable

Relative PV or Tare: The E.C.I. can be set to be **Rel.PV** function. When the E.C.I. is closed, the reading will show the differential value.

PV Hold: The E.C.I. can be set to be **Pv.HLd** function. The display will be hold when the E.C.I. is closed, until the E.C.I. is to be open. Please refer to the below figure.



Reset for Maximum or Minimum Hold: When the [**DSPLY**] function in [**inPUt GroUP**] selected **MAX.H** or **Mini.H**, the display will show Maximum or Minimum value, and can be reset by the E.C.I (close). Please refer to the figure as below.



DI: The E.C.I can be set to be **di** function, when the meter building in RS485 port. It is easier to get remote monitoring a switch status through the meter as like as DI of PLC.

Reset for Relay Energized Latch: If relay energized mode has set to be Energized latch (**Hi.HLd** / **Lo.HLd**), the E.C.I. can be set to be **rY.rSt**. When the PV meets the condition of relay energizing, the relay will be energized and latch until the E.C.I. is closed.

For Totalizer / Batch / Batch Counter

Gate function:

When the ECI close, the totalizer, Batch or Batch counter will stop to accumulate and keep the value until the ECI open.

There are three mode programmable; Totalizer, Batch & Batch counter / Totalizer / Batch & Batch Counter.

Reset function:

When the ECI close, the totalizer, Batch or Batch counter will reset to "0", and start to count until the ECI open.

There are three mode programmable; Totalizer, Batch & Batch counter / Totalizer / Batch & Batch Counter.

Pulse Output(Optional)

The totalizer has been built in a pulse output to relative totalizer, batch or batch counter programmable. The terminals are same as relay 4 so that can not exit relay 4 and pulse output in one totalizer.

Pulse divider:

> **PLS.dv** set to be **1**: It will output 1 pulse, when totalizer increases "1Count". Ex: It will output 1 pulse, when totalizer from 12345.678 increase to 12345.679.

- > **PLS.dv** set to be **1000**: It will output 1 pulse, when totalizer increases "1000Count". Ex: It will output 1 pulse, when totalizer from 12345.678 increase to 12346.678

Analogue output(option)

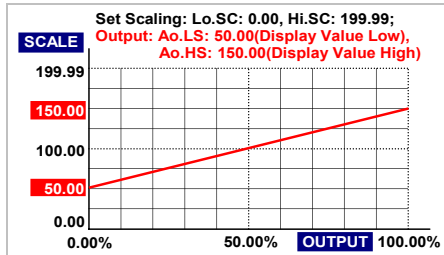
Please specify the output type either an 0~10V or 4(0)~20mA in ordering. The programmable output low and high scaling can be based on various display values. Reverse slope output is possible by reversing point positions.

Output range:

Voltage: 0~5V / 0~10V / 1~5V programmable
 Current: 0~10mA / 0~20mA / 4~20mA programmable

Functions:

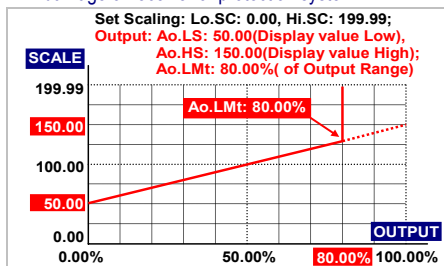
Ao.HS(output range high): setting the Display value High to versus output range High(as like as 20mA in 4~20)
Ao.LS(output range Low): setting the Display value Low to versus output range Low(as like as 4mA in 4~20)



The range between **Ao.HS** and **Ao.LS** should be over 20% of span at least; otherwise, it will be got less resolution of analogue output.

Ao.LMt(output High Limit): 0.00~110.00% of output High

User can set the high limit of output to avoid a damage of receiver or protection system.



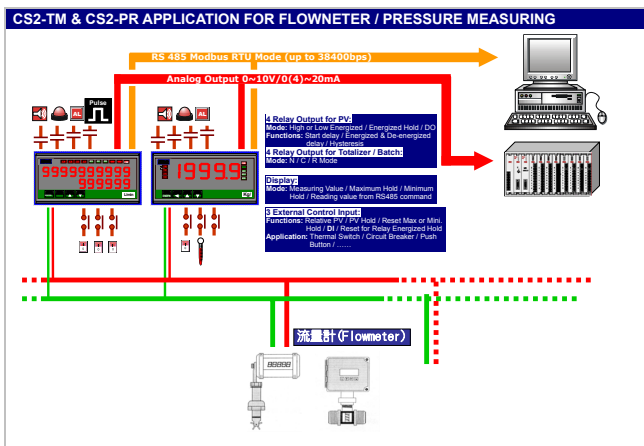
Fine zero & span adjustment:

Users can get Fine Adjustment of analogue output by front key of the meter. Please connect standard meter to the terminal of analogue output. To press the front key(up or down key) of meter to adjust and check the meter the output.

- [**Ao.Zro**] : Fine Zero Adjustment for Analog Output; Settable range: -38011~27524;
- [**Ao.Spn**] : Fine Span Adjustment for Analog Output; Settable range: -38011~27524;

RS 485 Communication(option)

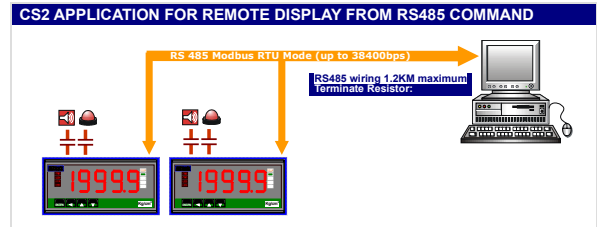
The RS485's protocol is Modbus RTU mode, and baud rate up to 38400 bps. It's not only convenience to remote monitoring, display for reading and ECI status, but also for remote control in the case that doesn't have any DIO device in the field.



Remote display:

The meter will show will show the value in down screen that received from RS485 command sending value.

When the [**dSPLY**] set to be RS485, it means, the down screen will show the number from RS485 command & data. The data(number) will be same as PV that will make totalizer/batch/batch counter to accumulate, compare with set-point, analogue output and ECI functions so that is to control analogue output, relay energized and so on.



OPTIONAL FUNCTION

Customize function with quantities is welcome. Please contact with our sales for detail. The appendix code of optional function will be add behind the code of auxiliary power as like as xxx-A-3BK.

BANK FUNCTION(Suffix-3BK)

- The function is for CS2 to control difference process with a same meter.
- For example; A pressure testing equipment; it has to measure multi-range with difference pressure transducers. The meter can be pre-set 4 groups parameter to show difference scale and relay energized in difference set-points. The operator just selects the bank number (bank1) to meet the process (product A). To make easier operating and to avoid mistake in process.
- The bank function is available in CS2-TM (optional) too. It's useful to control as like as filling machine, Air flow measurement with difference sensor.
- 4 banks pre-set for all relay functions relative 4 difference scaling, decimal point, and select by 3 External Control Inputs(E.C.I.) or front key.

Example:

- Product A:** Flow meter: 1.0000L/sec; Output: 4~20mA Set-Point: 2.0000L
- Product B:** Flow meter: 5.000L/sec; Output: 4~20mA Set-Point: 6.000L

Setting:

BANK1: **dp**:0.0000 **Lo.SC**: 0.0000 **Hi.SC**: 1.0000 **rY1.Md**: totL.C
rY1.SP: 2.0000 **rY1.rd**: 0(M).00.5(S)
 BANK2: **dp**:0.000 **Lo.SC**: 0.000 **Hi.SC**: 5.000 **rY1.Md**: totL.C
rY1.SP: 6.0000 **rY1.rd**: 0(M).01.0(S)

ECI.1: Bank.1 **ECI.2**: Bank.2;
 connect to a selector (or DO of PLC) to ECI1 and ECI2

- > The order want to produce **Product A**, to switch selector to A(Label **A** on panel), and then ECI.1 close, the square green LED bright. The meter will work base on the setting of bank1 and relay1 output on 2.0000.
- > The second order want to produce **Product B**, to switch selector to B(Label **B** on panel), and then ECI.2 close, the square green LED bright. The meter will work base on the setting of bank2 and relay1 output on 6.000.
- Only 1 Bank can be selected. The priority is Bank1 > Bank2 > Bank3, if it is double selection.

■ ERROR MASAGE

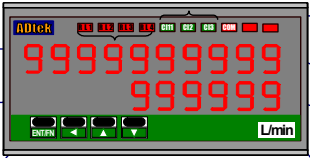
DESCRIPTION	DISPLAY	FLASH	REMARK
BEFORE POWER ON, PLEASE CHECK THE SPECIFICATION AND CONNECTION AGAIN.			
SELF-DIAGNOSIS AND ERROR CODE:			
ouFL : Display is positive-overflow (Signal is over display range)	ouFL		(Please check the input signal)
-ouFL : Display is negative-overflow (Signal is under display range)	-ouFL		(Please check the input signal)
ouFL : ADC is positive-overflow (Signal is higher than input 120%)	ouFL		(Please check the input signal)
-ouFL : ADC is negative-overflow (Signal is lower than input -120%)	-ouFL		(Please check the input signal)
EEP / FA IL : EEPROM occurs error	EEP	FA IL	(Please send back to manufactory for repaired)
A I.C.nG / Pu : Calibrating Input Signal do not process	A I.C.nG	Pu	(Please process Calibrating Input Signal)
A I.C. / FA IL : Calibrating Input Signal error	A I.C.	FA IL	(Please check Calibrating Input Signal)
AoC.nG / Pu : Calibrating Output Signal do not process	AoC.nG	Pu	(Please process Calibrating Output Signal)
A I.C. / FA IL : Calibrating Output Signal error	A I.C.	FA IL	(Please check Calibrating Output Signal)

■ FRONT PANEL

Relay status Indication

Up screen for Totalizer

Operation Key



Control Input status

Comm. status

Down screen for PV or Batch Engineer Unit

CS2-TM has two display screens and I/O status indication for purposes.

- Numeric Screens**
 - Up screen:** 0.28”(0.71cm) red high-brightness LED for 10 digital totalizer.
 - Down screen:** 0.28”(0.71cm) red high-brightness LED for Immediate Value 4 2/3 digital or Batch 6 digital.
- I/O Status Indication**
 - Relay Energized:** 4 square red LED
 - RL1** display when Relay 1 energized;
 - RL2** display when Relay 2 energized;
 - RL3** display when Relay 3 energized;
 - RL4** display when Relay 4 energized;
 - External Control Input Energized:** 3 square green LED
 - EC1** display when E.C.I. 1 close(dry contact)
 - EC2** display when E.C.I. 2 close(dry contact)
 - EC3** display when E.C.I. 3 close(dry contact)
 - RS485 Communication:** 1 square red LED
 - COM** will flash when the meter is receive or send data, and **COM** flash quickly means the data transient quicker.
- Stickers:**

Each meter has a sticker what are functions and engineer label enclosure.

 - Relay energized mode:** **HH Hf LOLL DO**
 - E.C.I. functions mode:**
 - PV.H** PV.H(PV Hold) / **Tare** Tare / **DI** DI /
 - M.RS** M.RS(Maximum or Minimum Reset) /
 - R.RS** R.RS(Reset fo Relay Latch)
 - Engineer Label:** over 80 types.

- Operating Key: 4 keys for** Enter(Function) / Shift(Escape) / Up key / Down key

	Setting Status	Function Index
Up key	Increase number	Go back to previous function index
Down key	Decrease number	Go to next function index
Shift key	Shift the setting position	Go back to this function index, and abort the setting
Enter/Fun key	Setting Confirmed and save to EEPROM	From the function index to get into setting status
- Pass Word:**

Setting range:0000~9999;

User has to key in the right pass word so that get into **【 Programming Level 】**. Otherwise, the meter will go back to measuring page. If user forgets the password, please contact with the service window.
- Function Lock:** There are 4 levels selectable for lock.
 - None:** no lock all.
 - User Level:** User level lock. User can get into user level for checking but setting.
 - Programming Level:** Programming level lock. User can get into programming level for checking but setting.
 - ALL:** All lock. User can get into all level for checking but setting.
- Front Key Function**
 - The Key can be set to be the same function as the setting of EC1.

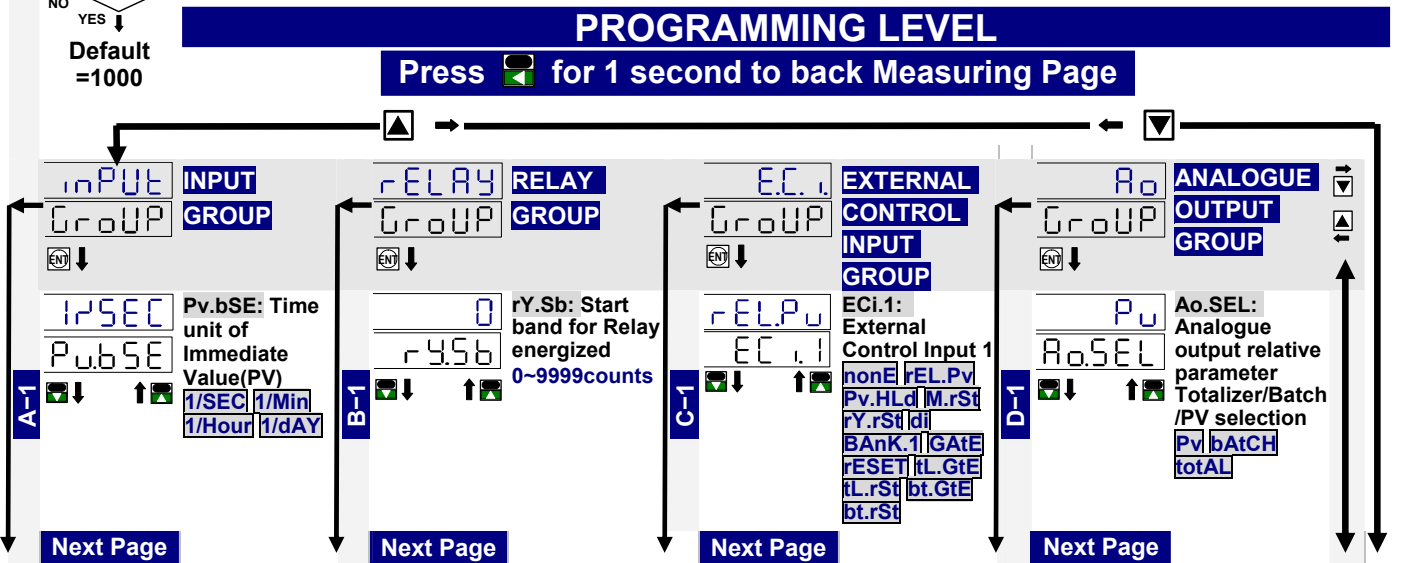
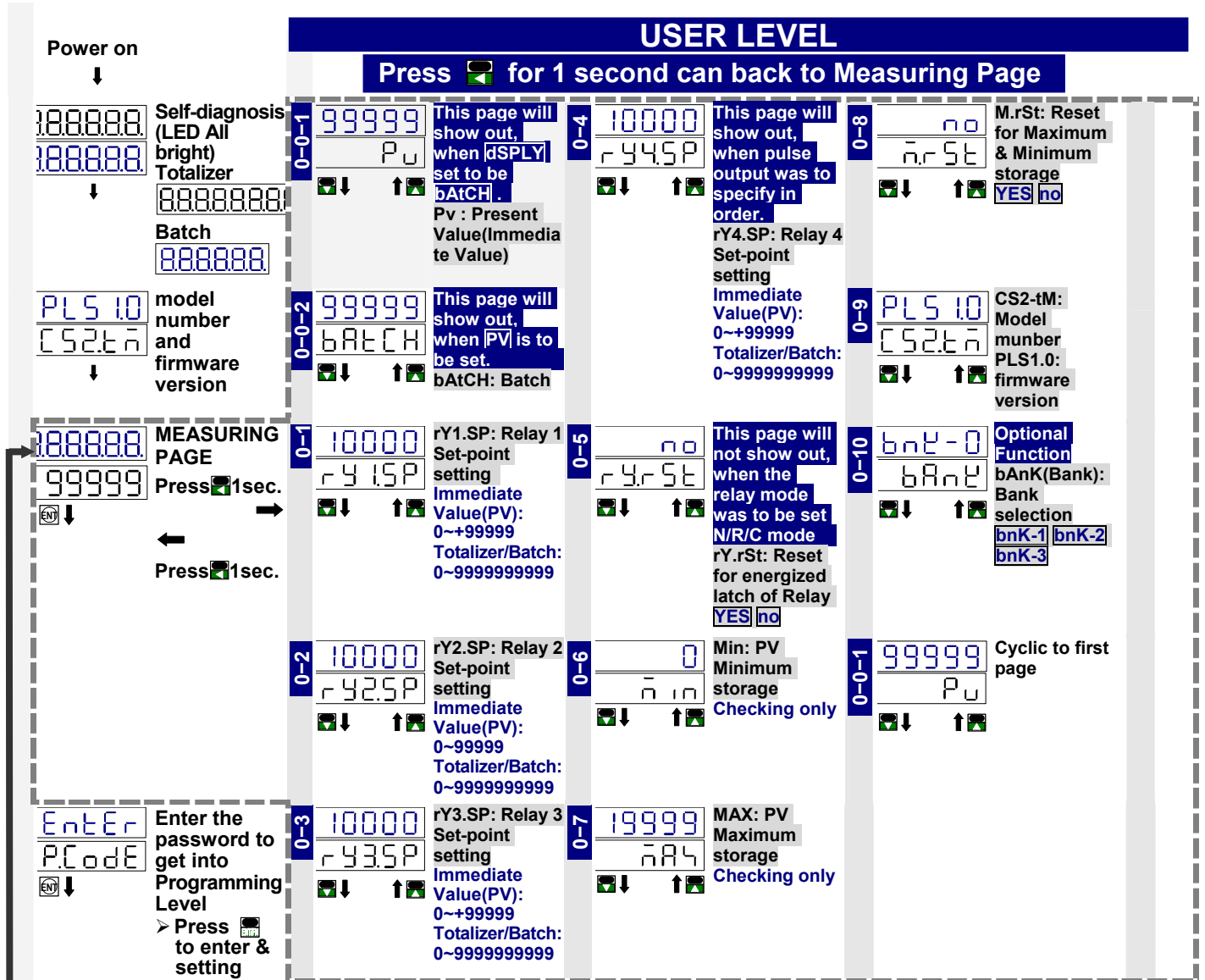
Ex. The EC1 set to be **Pv.HLd** and the function **【 E.1=UP 】** set to be **YES** in **【 ECI Group 】** . When user presses Key, the PV will hold as like as EC1 close.
 - The Key can be set to be the same function as the setting of EC2.

Ex. The EC2 set to be **rEL.Pv** and the function **【 E.2=dn 】** set to be **YES** in **【 ECI GroUP 】** . When user presses Key, the PV will show relative value as like as EC2 close.

➤ **If the front key function has been set, the terminal input for ECI will be disabling.**

OPERATING DIAGRAM (The detail description of operation, Please refer to operating manual)

CS2-TM(Pulse)



<p>A-2</p> <p>PLS/F F.tYP</p> <p>↓ ↑</p>	<p>The difference mode selected will show up relative parameters</p> <p>F.tYP: Modes description of Flowmeter</p> <p>PLS/F F/PLS d.MUL.v</p>	<p>B-2</p> <p>0.0000 rY.Sd</p> <p>↓ ↑</p>	<p>rY.Sd: Start delay time for Relay energized</p> <p>0:00.0~ 9(M):59.9(S)</p>	<p>C-2</p> <p>PuHLd EC.1.2</p> <p>↓ ↑</p>	<p>ECi.2: External Control Input 2</p> <p>nonE rEL.Pv Pv.HLd M.rSt rY.rSt di BAnK.1 GATE rESEt rL.GtE tL.rSt bt.GtE bt.rSt</p>	<p>D-2</p> <p>A.4-20 Ao.tYP</p> <p>↓ ↑</p>	<p>Ao.tYP: Analogue Output type</p> <p>v.0~10 v.0-5 v.1-5 A.0-10 A.0-20 A.4-20</p>
<p>A-3-1-1</p> <p>0 P.F.dP</p> <p>↓ ↑</p>	<p>The page will show out, when PLS/F is to be set.</p> <p>P/F.dP: Decimal Point of P/Flow(unit) (K Factor)</p> <p>0~0.0000</p>	<p>B-3</p> <p>totLn rY1.nD</p> <p>↓ ↑</p>	<p>rY1.Md: Relay 1 energized mode</p> <p>oFF Lo Hi Lo.HLd btCH.n btCH.r btCH.C totL.n totL.r totL.C</p>	<p>C-3</p> <p>n.rSt EC.1.3</p> <p>↓ ↑</p>	<p>ECi.3: External Control Input 3</p> <p>nonE rEL.Pv Pv.HLd M.rSt rY.rSt di BAnK.1 GATE rESEt rL.GtE tL.rSt bt.GtE bt.rSt</p>	<p>D-3</p> <p>0 Ao.LS</p> <p>↓ ↑</p>	<p>Ao.LS: Analogue Output relative Low Scale</p> <p>Immediate Value(PV): -19999~+29999</p> <p>Totalizer/Batch: 0~9999999999</p>
<p>A-3-1-2</p> <p>10000 PLS/F</p> <p>↓ ↑</p>	<p>PLS/F: P/Flow(unit) (K Factor) Setting</p> <p>0.0001~99999</p>	<p>B-4-0</p> <p>0.0000 rY1.ot</p> <p>↓ ↑</p>	<p>The page will show out, when rY1.Md set to be N/R/C mode.</p> <p>rY1.ot: Relay 1 energized time</p> <p>0:00.0~ 9(M):59.9(S)</p>	<p>C-4</p> <p>12 dEbnc</p> <p>↓ ↑</p>	<p>dEbnc: Debouncing of external control Input</p> <p>5~255(x8ms)</p>	<p>D-4</p> <p>19999 Ao.HS</p> <p>↓ ↑</p>	<p>Ao.HS: Analogue Output relative High Scale</p> <p>Immediate Value(PV): -19999~+29999</p> <p>Totalizer/Batch: 0~9999999999</p>
<p>A-3-2-1</p> <p>0 F.P.dP</p> <p>↓ ↑</p>	<p>The page will show out, when F/PLS is to be set.</p> <p>F/P.dP: Decimal Point of Flow/P (1/K Factor)</p> <p>0~0.0000</p>	<p>B-4</p> <p>0 rY1.HY</p> <p>↓ ↑</p>	<p>The page will show out, when rY1.Md set to be Hi/Lo mode.</p> <p>rY1.HY: Relay 1 Hysteresis</p> <p>0~5000 counts</p>	<p>C-5</p> <p>YES E.1=UP</p> <p>↓ ↑</p>	<p>E.1=UP: E.C.I.1=UP; Up key will be same function as E.C.I.1 set.</p> <p>YES no</p>	<p>D-5</p> <p>0 Ao.Zro</p> <p>↓ ↑</p>	<p>Ao.Zro: Fine Zero Adjustment for Analog Output</p> <p>Immediate Value(PV): -38011~+27524</p> <p>Totalizer/Batch: 0~9999999999</p>
<p>A-3-2-2</p> <p>10000 F/P.LS</p> <p>↓ ↑</p>	<p>F/PLS: Flow/Pulse (1/K Factor) Setting</p> <p>0.0001~99999</p>	<p>B-5</p> <p>0.0000 rY1.rD</p> <p>↓ ↑</p>	<p>The page will show out, when rY1.Md set to be Hi/Lo mode.</p> <p>rY1.rD: Relay 1 energized delay time</p> <p>0:00.0~ 9(M):59.9(S)</p>	<p>C-6</p> <p>YES E.2=dn</p> <p>↓ ↑</p>	<p>E.2=dn: E.C.I.2=Down; Down key will be same function as E.C.I.2 set.</p> <p>YES no</p>	<p>D-6</p> <p>0 Ao.SPn</p> <p>↓ ↑</p>	<p>Ao.SPn: Fine Span Adjustment for Analog Output</p> <p>Immediate Value(PV): -38011~+27524</p> <p>Totalizer/Batch: 0~9999999999</p>
<p>A-3-3-1</p> <p>0 d.nDp</p> <p>↓ ↑</p>	<p>The page will show out, when d.MUL.v is to be set.</p> <p>diA.dP: Decimal Point of diameter of pipe</p> <p>0~0.0000</p>	<p>B-6</p> <p>0.0000 rY1.Fd</p> <p>↓ ↑</p>	<p>The page will show out, when rY1.Md set to be Hi/Lo mode.</p> <p>rY1.Fd: Relay 1 de-energized delay time</p> <p>0:00.0~ 9(M):59.9(S)</p>	<p>D-7</p> <p>nonE Z.S.Clr</p> <p>↓ ↑</p>	<p>Z.S.Clr: Clear Fine Zero / Span Adjustment for Analog Output</p> <p>nonE Ao.Zro Ao.SPn both</p>		
<p>A-3-3-2</p> <p>10000 d.Ant</p> <p>↓ ↑</p>	<p>The page will show out, when d.MUL.v is to be set.</p> <p>diAMt: Diameter of pipe setting</p> <p>0.0001~99999 (Unit)</p>	<p>B-7</p> <p>Hi rY2.nD</p> <p>↓ ↑</p>	<p>rY2.Md: Relay 2 energized mode</p> <p>oFF Lo Hi Lo.HLd btCH.n btCH.r btCH.C totL.n totL.r totL.C</p>	<p>D-8</p> <p>110.00 Ao.LMt</p> <p>↓ ↑</p>	<p>Ao.LMt: Analog Output High Limit</p> <p>0.00~110.00% of FS</p>		
<p>A-3-3-3</p> <p>0 vL.dP</p> <p>↓ ↑</p>	<p>The page will show out, when d.MUL.v is to be set.</p> <p>vL.dP: Decimal Point of Flow speed (Lengh/sec)</p> <p>0~0.0000</p>	<p>B-8-0</p> <p>0.0000 rY2.ot</p> <p>↓ ↑</p>	<p>The page will show out, when rY2.Md set to be N/R/C mode.</p> <p>rY2.ot: Relay 2 energized time</p> <p>0:00.0~ 9(M):59.9(S)</p>				

<p>A-3-4</p> <p>The page will show out, when d.MUL.v is to be set. vL/Hz: Valume/Hz, Flow speed setting 0.0001~99999 (Unit)</p>	<p>B-8</p> <p>The page will show out, when rY2.Md set to be Hi/Lo mode. rY2.HY: Relay 2 Hysteresis 0~5000 counts</p>
<p>A-4</p> <p>SP.dP: Decimal point of set-point for Realy energized 0~0.0000</p>	<p>B-9</p> <p>The page will show out, when rY2.Md set to be Hi/Lo mode. rY2.rd: Relay 2 energized delay time 0:00.0~9(M):59.9(S)</p>
<p>A-5</p> <p>ttL.dP: Decimal point of totalizer 0~0.0000</p>	<p>B-10</p> <p>The page will show out, when rY2.Md set to be Hi/Lo mode. rY2.Fd: Relay 2 de-energized delay time 0:00.0~9(M):59.9(S)</p>
<p>A-6</p> <p>UP.dSP: Up screen displays totalizer or batch Counter tL Bt.Cnt</p>	<p>B-11</p> <p>rY3.Md: Relay 3 energized mode oFF Lo Hi Hi.HLd Lo.HLd do btch.n btch.r btch.C totL.n totL.r totL.C</p>
<p>A-7</p> <p>oFL.Md: overflow mode of totalizer or batch oVFL rCYCL</p>	<p>B-12-0</p> <p>The page will show out, when rY3.Md set to be N/R/C mode. rY3.ot: Relay 3 energized time 0:00.0~9(M):59.9(S)</p>
<p>A-8</p> <p>SiGn: Sign of accumulate up or down PStvE dUAL</p>	<p>B-12</p> <p>The page will show out, when rY3.Md set to be Hi/Lo mode. rY3.HY: Relay 3 Hysteresis 0~5000 counts</p>
<p>A-9</p> <p>Pv.SPn: Fine Span Adjustment for Immediate Value(PV) display 0.00~100.00%</p>	<p>B-13</p> <p>The page will show out, when rY3.Md set to be Hi/Lo mode. rY3.rd: Relay 3 energized delay time 0:00.0~9(M):59.9(S)</p>
<p>A-10</p> <p>S.CLr: Clear Fine Span Adjustment for Immediate Value(PV) display YES no</p> <p>Next Page</p>	<p>B-14</p> <p>The page will show out, when rY3.Md set to be Hi/Lo mode. rY3.Fd: Relay 3 de-energized delay time 0:00.0~9(M):59.9(S)</p> <p>Next Page</p>

<p>E-1</p> <p>AdRES: Device number of the meter 1~255</p>	<p>E-2</p> <p>bAUD: Baud rate 1200 2400 4800 9600 19200 38400</p>
<p>E-3</p> <p>PrItY: Parity n.Stb.1 n.Stb.2 odd EvEn</p>	<p>RS485 GROUP</p>

<p>A-11</p> <p>dsPLY: Display Function for down screen</p> <p>Pv Mini.H MAX.H RS485 bAtCH</p>	<p>dsPLY: Display Function for down screen</p> <p>Pv Mini.H MAX.H RS485 bAtCH</p>	<p>B-15</p> <p>The page will not show out, when pulse output has been specified.</p> <p>rY4.Md: Relay 4 energized mode</p> <p>oFF Lo Hi Hi.HLd Lo.HLd do btch.n btch.r btch.C totL.n totL.r totL.C</p>
<p>A-12</p> <p>Lo.Cut: Low Cut</p> <p>-29999~+29999</p>	<p>Lo.Cut: Low Cut</p> <p>-29999~+29999</p>	<p>B-16-0</p> <p>The page will show out, when rY4.Md set to be N/R/C mode.</p> <p>rY4.ot: Relay 4 energized time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-13</p> <p>ito.Md: Input Time Out Mode</p> <p>AUto MAnUL</p>	<p>ito.Md: Input Time Out Mode</p> <p>AUto MAnUL</p>	<p>B-16</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.HY: Relay 4 Hysteresis</p> <p>0~5000 counts</p>
<p>A-14</p> <p>The page will show out, when ito.Md set to be MAnUL.</p> <p>ito: The time of time out</p> <p>0.0~999.9 sec</p>	<p>The page will show out, when ito.Md set to be MAnUL.</p> <p>ito: The time of time out</p> <p>0.0~999.9 sec</p>	<p>B-17</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.rd: Relay 4 energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-15</p> <p>rAnGE: Input range</p> <p>AUto SEMI MAnUL</p>	<p>rAnGE: Input range</p> <p>AUto SEMI MAnUL</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-16</p> <p>AvG: Average display for immediate Value(PV)</p> <p>1(None)~99 times</p>	<p>AvG: Average display for immediate Value(PV)</p> <p>1(None)~99 times</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-17</p> <p>d.Filt: Digital Filter</p> <p>0(None)1~99 times</p>	<p>d.Filt: Digital Filter</p> <p>0(None)1~99 times</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-18</p> <p>The page will show out, when pulse output specified.</p> <p>PLS.dv: Pulse divider</p> <p>1~9999counts</p>	<p>The page will show out, when pulse output specified.</p> <p>PLS.dv: Pulse divider</p> <p>1~9999counts</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-19</p> <p>P.CodE: Pass code</p> <p>0000~9999</p>	<p>P.CodE: Pass code</p> <p>0000~9999</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>
<p>A-20</p> <p>F.LoCK: Function lock</p> <p>nonE USEr EnG ALL</p>	<p>F.LoCK: Function lock</p> <p>nonE USEr EnG ALL</p>	<p>B-18</p> <p>The page will show out, when rY4.Md set to be Hi/Lo mode.</p> <p>rY4.Fd: Relay 4 de-energized delay time</p> <p>0:00.0~9(M):59.9(S)</p>

➤ Please refer to operating manual for detail description.