

# ST-LC

## MATH CONDITIONER WITH LED DISPLAY

### OPERATION MANUAL



## FEATURES

- Measuring 2 channels 0~10V / 0(4)~20mA or 0~10.0mV/~400.0mV with dual display screen for dual isolated input
- Field calibration with strain gauge to meet the system requirement
- Accuracy:  $\pm 0.04\%$  or  $\pm 0.1\%$ ; Display range: -19999~99999
- Mathematic function Addition / Subtraction / high or low selector in 2 channels input
- Analogue output, RS 485 communication port or 1 Relay output available
- Analogue output can be selected in 0~10V/0(4)~20mA
- 1 Relay output for Hi / Lo energized with Start Delay / Hysteresis / Energized & De-energized Delay / Relay Energized Hold..... functions
- RS 485 communication port available
- CE Approved



## APPLICATIONS

Tension and others test equipment / Weighting indication, control and Alarm / Valve chest control of central air condition ice water system (Tracking High or Low) / Two group of analog signals transfer to RS 485 --- Communication with PC/PLC

## FUNCTION DEFINE

### Character Symbol

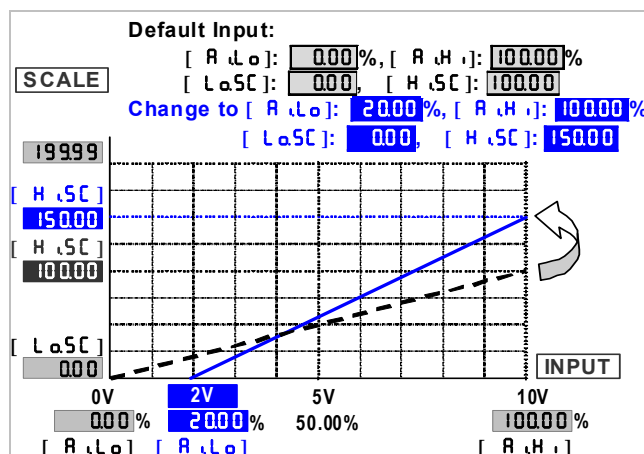
A	b	C	d	E	F	G	H	i	J	K	L	M
R	b	C	d	E	F	G	H	i	J	K	L	M
n	o	P	q	r	S	t	U	v	W	X	y	Z
n	o	P	q	r	S	t	U	v	W	X	y	Z
1	2	3	4	5	6	7	8	9	0	/	.	
1	2	3	4	5	6	7	8	9	0	/	.	

### Input & Scaling

ST-LC has two inputs (internal isolation between two inputs) , the customer may according to the scene need , assing two different inputs , example : input 1 is 4~20mA and input 2 is Pt100Ω(Optional) ; This two inputs may also establish the related parameter individually , establish mathematics function between two inputs .

### Input Range [R.L.O] & [R.H.I]

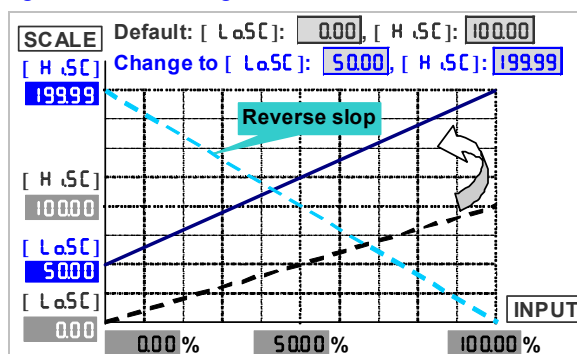
The meters had been set the input range as per order code (ex. 0~10V or 4(0)~20mA) in factory. If the meters requested to convert into difference inputs ranges, the meters can be switched function [R.L.O] and [R.H.I] in [INPUT GROUP] to meet the input signal. For example: The meter is 0~10Vdc input, and the signal from sensor is 2~10Vdc. Please enter into the [INPUT GROUP] to set [R.L.O] (Analogue input Low) to be 20.00% (10V x 20.00% = 2V), then the meter has been converted the input range into 2~10Vdc and the all relative parameters be processed by 2~10V.



### Scaling Function [H.S.C] and [L.O.S]

**Programming range: -19999~+29999counts**

Setting the [L.O.S] (Low scale) and [H.S.C] (High scale) in [INPUT GROUP] which are relative to input signal. Reverse scaling will be set too. Please refer to the below figures as following,



\*Lower resolution display may be caused by more narrow scale. If the [R.L.O] & [R.H.I] have been changed, the [L.O.S] & [H.S.C] will be related to the new setting of [R.L.O] & [R.H.I].

## Display Functions

■ **Mathematics Function:** Display screen may carry out mathematics + - × ÷ and display operation result

- ▶ If operation result surpasses 99999, the display will be **o.u.F.L** (overflow)
- ▶ **When × (multiply operation)**, decimal point display automatically for the biggest resolution, decided by product result of **H .5C.1** (High Scale of input 1) and **H .5C.2** (High Scale of input 2)

For example: **H .5C.1** is 100.00 ; **H .5C.2** is 200.00  
multiplication result to display 20000, and does not have decimal point or

**H .5C.1** is 10.000 ; **H .5C.2** is 5.00 multiplication  
result to display 50.000 and decimal digits is 3

- ▶ **When ÷ (division operation)**, decimal point is decided by dividend of **H .5C.1** (High Scale of input 1) and **H .5C.2** (High Scale of input 2)

For example: **H .5C.1** is 800.00 ; **H .5C.2** is 20.000 ;  
division result to display 40.00

### ■ Tracking high or low value:

When [**P.u.I2**] is setted **[r.r.H]** or **[r.r.L]**, display screen will display high or low value of two inputs, this function most adapts uses in HVAC control.

### ■ Max / Mini recording

In order to review & trace the drifting PV, the meters will keep the values of maximum and minimum in [**user level**] during power on. User can reset the values by [**r.r.S**] in [**user level**]. And it'll record new maximum and minimum value immediately after reset.

### ■ Display function [**d5PLy**] for display screen

The [**d5PLy**] function in [**input GROUP**] can be set to show present value **[P.u]**, Maximum Hold **[r.r.Hd]** or Minimum Hold **[r.r.Hd]** or Remote display by RS485 command **[5485]**. Please refer to following for detail.

#### ● Present value **[P.u]**

Display screen will show the value that is relative to input and [**L.a5C**] (Low scale) and [**H .5C**] (High scale) setting.

#### ● Remote display **[5485]** by RS485 command

In past, The meter normally receive 4~20mA or 0~10V from AO card or BCD card of PLC. We built-in a new solution by RS485 which it can writing the value to the display screen so that saving costs of AO and wiring connecting to PLC simultaneously. When the [**d5PLy**] function set to be **[5485]**, the LED display no longer appear the input signal on the meter then the PV screen will display the data from RS485 command. The data(number) will be same function as PV which it will compare with set-point, analogue output and ECI functions.

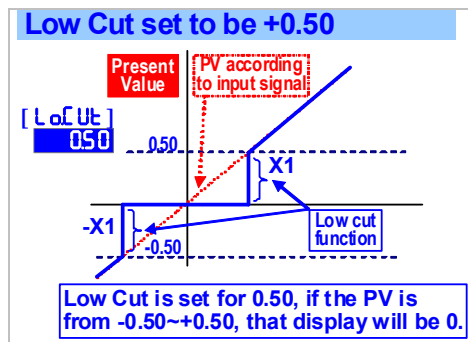
### ■ Low Cut [**L.aC.Ut**]

**Settable range from -19999~+29999 digits.**

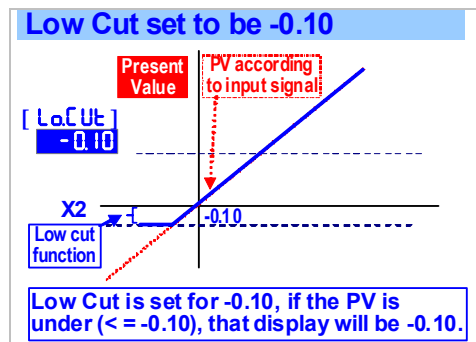
if set the positive value (X1) here to display "0" which it expressed to be low-cut the PV between "+X1(plus)" & "-X1(minus)" /absolute value

PV < | Setting value (X1) |, the display will be shown 0

EX: Low Cut is set for 0.50. If the display is from -0.50~+0.50, that will be 0.



If set the negative value (X2) here to display "X2" which it expressed to be low-cut the PV that it's under the X2 setting value;  
PV < Setting value(X2), the display will be shown X2.  
EX: Low Cut is set for -0.01. If the display is < -0.01, and all the display will be -0.01.



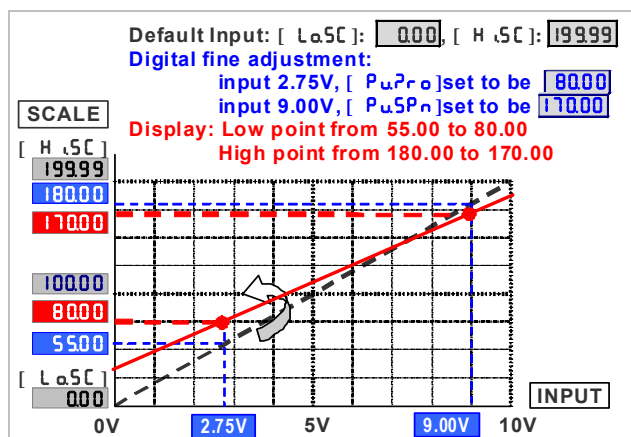
### ■ Digital Fine Adjustment [**P.u.r.o**] & [**P.u5P.n**]

**Settable range from -19999~+29999 ;**

Users can get "Fine Adjustment PV" by front key on the meter for lower and/or higher points. "Just Key-In" the value, if user wants to show the value in input signals currently.

Especially, the [**P.u.r.o**] & [**P.u5P.n**] are not only in zero & span of PV, but also randomly lower point in function [**P.u.r.o**] & randomly higher point in function [**P.u5P.n**]. The meter will be auto-linearization for full scale.

The adjustment can be cleared in function [**P.5C.L.r**].



\*Please make sure that the [**P.u.r.o**] point must be less than [**P.u5P.n**] during the process of digital fine adjustment. Generally, the interval should be over 50% of input range. If the interval is too narrow, that may be made bigger error between zero and span.

## Reading stable functions

### Average Display update [ $R_{UD}$ ]

Settable range: 1~99 times;

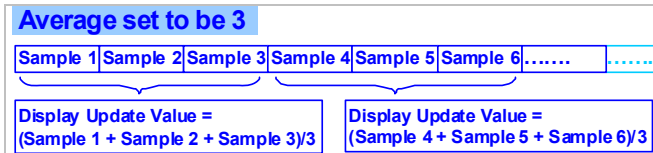
Jittery Display caused by the noise or unstable signal. User can set the times to average the readings, and to get smoothly display.

Remark: To set the average times with higher will make the response time slower of Relay and Analogue output.

The meter's sampling is 15cycle/sec

If the [  $R_{UD}$  ](Average) set to be  $\boxed{3}$  to express the display update with 5 times/sec.

The meter will calculate the sampling 1-3 and update the display value. At meantime, the sampling 4-6 will be processed to calculate.



### Moving Average update [ $m_{RUD}$ ]

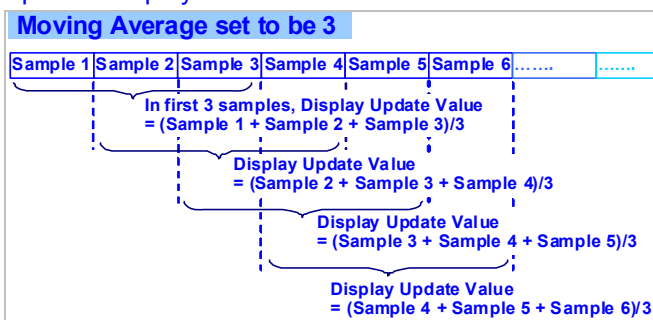
Settable range: 0(no function)/1~10 times;

Jittery Display caused by the reasons as like as noise or unstable signal. User can set the times to average the readings, and get smoothly display.

Remark: To set the moving average times with higher wouldn't affect the response time of Relay and Analogue output except the 1<sup>st</sup> updated display value will be slower.

The meter's sampling is 15cycle/sec. If the [  $m_{RUD}$  ](Moving Average) set to be  $\boxed{3}$  expressed the display update with 15 times/sec.,

In the first updated display value will be same as average function. In the next updated display value, the function will get the new fourth sample (sample 4) then throw away the first sample (sample 1) that the newest 3 samples(sample 2,3,4) will be calculated for the updated display value.



### Digital filter [ $dF_{ILT}$ ]

Settable range from 0(None)/1~99 times.

The digital filter can reduce the influence of spark noise by magnetic of coil.

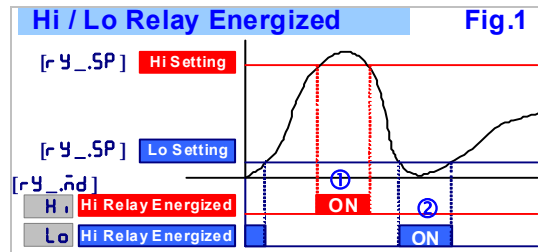
If the values of samples are over digital filter band(fixed in firmware and about 5% of stable reading) 3 times (Digital Filter set to be 3) continuously, the meter will admit the samples and update the new reading. Otherwise, it will be as treat as a noise and skip the samples.

## Relay Functions

ST-LC series offer the 2 relay outputs with more flexible and multi-functions. They can be programmable individually in [  $r_{ELRY}$  Gr oUP ] . Please refer to the description as following;

### Relay energized mode [ $r_{Y_{nd}}$ ] Hi / Lo / Hi(Lo) latch / DO

- **Hi (  $H_i$  ) (Fig.1-①):** Relay will be energized, when PV > Set Point
- **Lo (  $L_o$  ) (Fig.1-②):** Relay will be energized, when PV < Set Point

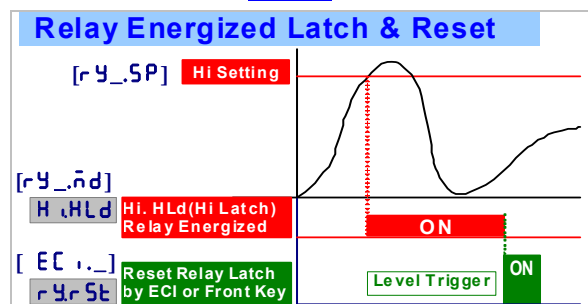


### Hi alarm & latch / Lo alarm & latch ( $H_{iHLD}$ / $L_{oHLD}$ )

The relay energized with latched function is for electrical safety and human protection.

For example, a current meter relay installed for the over current alarm of motor. Generally, over current of motor caused by over load, mechanical dead lock, aging of insulation and so on. Above cases will alarm in the meter, if the user doesn't figure out the real reason and re-start the motor. It may damage the motor. The functions of Hi.HLD & Lo.HLD are designed must be manual reset the alarm after checking out and solving the issue. It's very important idea for electrical safety and human protection.

As the PV Higher (or lower) than set-point, the relay will be energized to latch except manual reset by from key in [ **user level** ] [  $r_{YrSt}$  ] is closed.



### do(Digit Output) ( $do$ ):

The function has been designed not only a meter but also an I/O interface. In the case of motor control cabinet can't get the remote function. It's very easily to get the ON/OFF status of switch from ST-LC series with RS485 function.

If the [  $r_{Y_{nd}}$  ] had been set  $\boxed{do}$ , the relay will be energized by RS485 command directly, but no longer to compare with set-point.

### Start delay band [ $r_{Ysb}$ ] and Start delay time [ $r_{Ysd}$ ]

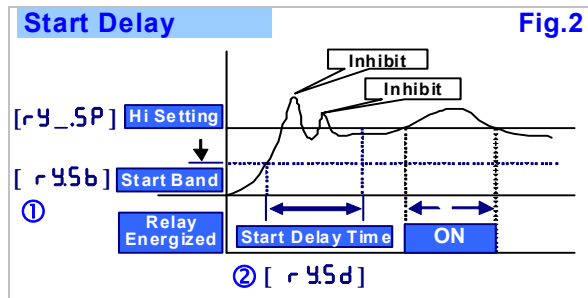
The functions have Been designed for,

1. To avoid starting current of inductive motor (6 times of rated current) with alarm.
2. If the [  $r_{Y_{nd}}$  ] relay energized mode had been set to be  $\boxed{L_o}$  (Lo) or  $\boxed{L_{oHLD}}$  (Lo & latch). As the meter is

power on and no input to display the "0" caused the relay will be energized. User can set a band and delay time to inhibit the energized of relay.

- **Start band [rY5b] (Fig.2-①):**  
Settable range from 0~9999 Digits
- **Start delay time [rY5d] (Fig.2-②):**

Settable range from 0.0(second)~9(minutes)59.9(seconds);



- **Hysteresis [rYHY] (Fig.3-①)**  
Settable range from 0~9999 Digits

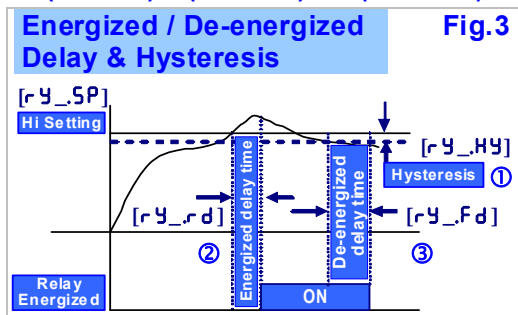
As the display value is swing near by the set point to cause the relay on and off frequently. The function is to avoid the relay on and off frequently such as compressor.....etc.,

User can set a band to prevent from the relay on and off frequently

- **Relay energized delay [rYrd] (Fig.3-②)**  
Settable range from 0.0(second)~9(minutes)59.9(seconds);

The function is to avoid the miss action caused by noise. Sometime, the display value will swing caused by spark of contactor.....etc.. User can set a period to delay the relay energized.

- **Relay de-energized delay [rYfd] (Fig.3-③)**  
Settable range from 0.0(second)~9(minutes)59.9(seconds)



## Analogue Output Functions

Please specify the output type either 0~10V or 4(0)~20mA in ordering code. The output low and high can be programmable which it's related with various display values. Reverse slope output is decided by reversing point positions.

- **Output range selection ([RαLSP])**

- **Voltage output specified**  
Programming :  $\frac{u0-10}{u0-5}$  (0~10V) /  $\frac{u0-5}{u1-5}$  (0~5V) /  $\frac{u1-5}{u1-5}$  (1~5V)
- **Current output specified**  
Programming :  $\frac{R4-20}{R0-20}$  (4~20mA) /  $\frac{R0-20}{R0-10}$  (0~20mA) /  $\frac{R0-10}{R0-10}$  (0~10mA)

- **Low Output corresponds to Low display value [RαLS]**

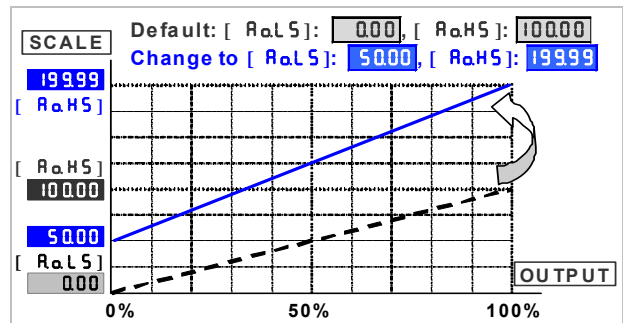
Settable range: -19999~+29999;

Setting the Low Display value versus Low output range (as like as 4mA in  $\frac{R4-20}{R0-20}$ ).

- **High Output corresponds to High display value [RαHS]**

Settable range: -19999~+29999;

Setting the High Display value versus High output range (as like as 20mA in  $\frac{R4-20}{R0-20}$ )



\*The interval between [RαHS] and [RαLS] should be with minimum over 20% of span; otherwise, it will reflect the less resolution of analogue output.

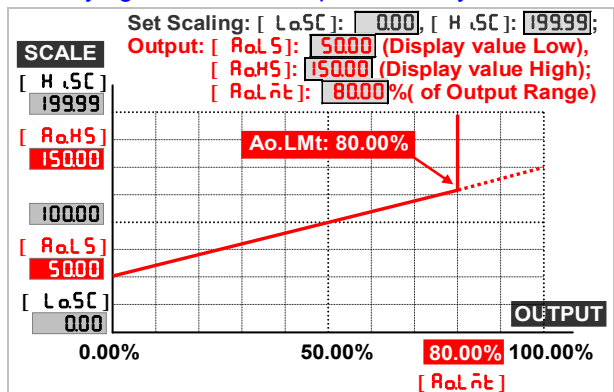
- **Fine Zero & Span Adjustment for Analogue Output**

Users can get Fine Adjustment of analogue output by front key on the meter. Please connect standard meter to the terminals of analogue output for measuring the output value. To press the front key(up or down key) of meter for adjusting and checking the output.

- **Fine Zero Adjustment for Analogue Output [RαZro]:**  
Settable range: -38011~27524;
- **Fine Span Adjustment for Analogue Output [RαSPn]:**  
Settable range: -38011~27524;
- **High Limited for Analog Output [RαLnt]**

Settable range: 0.00~110.00% of High output;

User can set the output in high limit to avoid destroying the receiver or protection system.

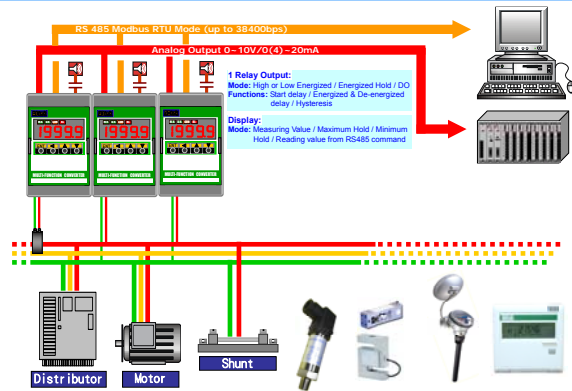


## RS485 Communication

ST-LC can be used as Remote Terminal Unit (RTU) for monitoring and controlling in a SCADA (Supervisor Control And Data Acquisition) system. It can read measured value and controls the relays output (DO) by RS485 communication ports.

- **Protocol:** Modbus RTU Mode
- **Baud Rate [bAud]:**  
Programmable 1200/2400/4800/ 9600/ 19200/ 38400
- **Data Bits:** 8 bits
- **Stop Bits:** Programmable 1 bit or 2 bits
- **Parity [Pr. uLy]:** Programmable Even / Odd / None
- **Device Number [Ad-ES]:** Settable 1~255

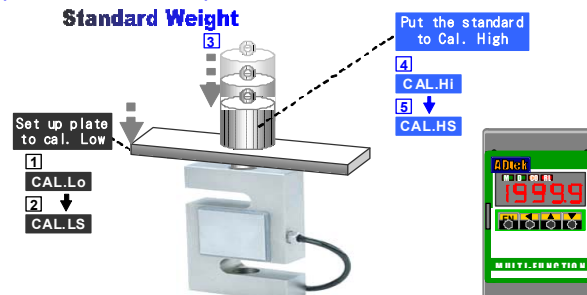
## ST-VA & ST-F APPLICATION FOR VOLTAGE / CURRENT & FREQUENCY MEASURING



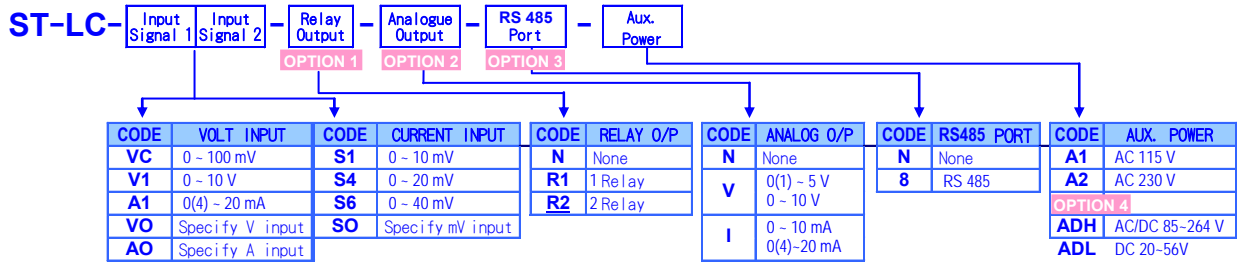
## Field Calibration

- In past time, the engineers have to take a lot of time to adjust and calibrate meters or converters which the purpose of co-coordinating with zero and span of machinery structure for the Load Cell or Potentiometer measuring. Now, our ST-LC with innovation functions against above to make the engineer operated easily and smoothly that it's called "Field Calibration".
- The low calibration of machinery structure is not need the exactly "zero" to calibrate, because of the "field calibration" function could be calibrate any lower point.
- After the calibration completes, may set low scale and high scale that are relative to the calibration low point and high point directly.
- Field calibration wouldn't change the default calibration. After user completing the field calibration, it can also select default calibration if the user wants.

Please according to the sequence to do the Field Cal.  
(1 ⇒ 2 ⇒ 3 ⇒ 4 ⇒ 5)

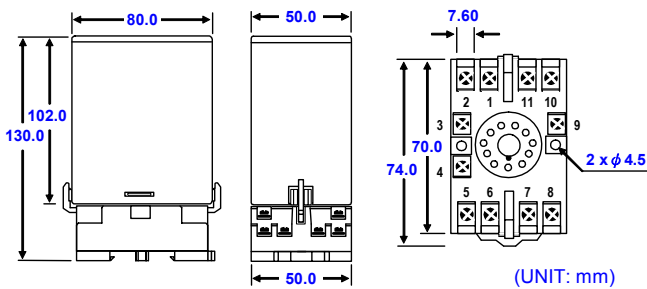


# ORDERING INFORMATION

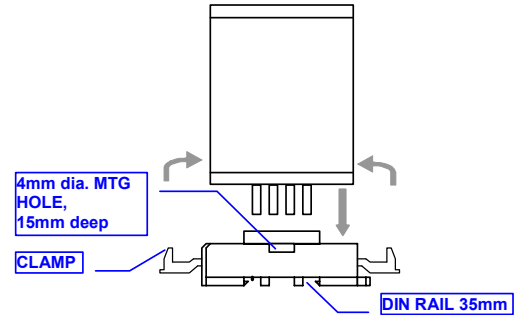


2 outputs can be specified at most for 1 Analogue \ 1 RS485 & 2 Relays ;  
 For example: specify 1 Analogue and 1 RS485 (2 outputs)  
 Model No.: ST-LC-xx-N-I-8-xx

## Dimensions



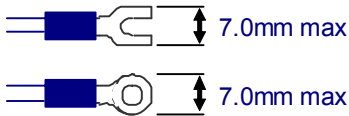
## Installation



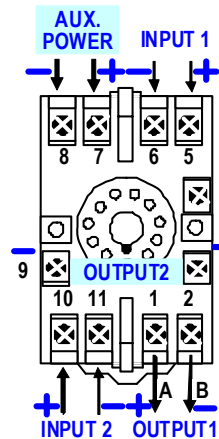
## Wiring Diagram

### Connector

10A/300Vac,  
 M3.0, 1.3~3.5mm<sup>2</sup> (22~12AWG);  
 Max torque: 13Kg-cm



Please set the torque of automotive screwdriver to match the limited of terminals.

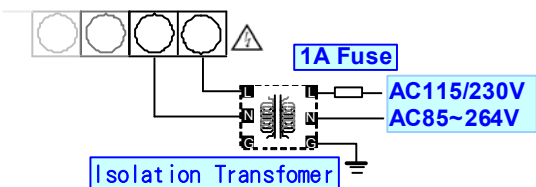


Remark: ST series has been designed in multi-output with limited terminals. Please check the output functions and specify terminals as label on product before wiring.

	OUTPUT 1	OUTPUT 2
	TERMINAL 1+ & 2-	TERMINAL 3+ & 9-
2 O/P	RS485	ANALOGUE
2 O/P	ANALOGUE	RELAY
2 O/P	RS485	RELAY
2 O/P	RELAY	RELAY
1 O/P	ANALOGUE	
1 O/P	RS485	
1 O/P	RELAY	

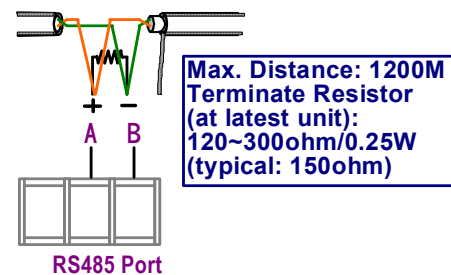
### Power Supply

Please check the voltage of power supplied first, and then connect to the specified terminals. Herein, recommended that power supplied with protection by a fuse or circuit breaker to the meter.



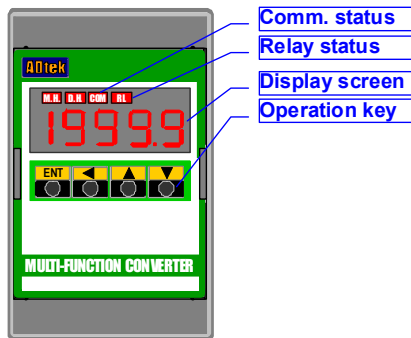
For input and RS485 wiring, Herein recommended using twin wire with shielding

### RS485 Communication Port



# OPERATIONS

## FRONT PANEL



### Numeric Screen:

- **8888.8**: 0.28”(0.71cm) red high-brightness LED ;

### I/O Status Indicators:

- **Relay Energized:** 1~3 square read LED
  - RL1** display when Relay 1 has been energized ;
  - RL2** display when Relay 2 has been energized ;
  - RL3** display when Relay 3 has been energized ;
- **COM** RS 485 Communiacion: 1 square orange LED will flash express the meter is receive or send data, and flash quickly means the data transient quicker.
- **Stickers:** Each meter with a sticker to describe what the functions together with engineer label enclosure.

### Function Stickers:

HH	HI	LO	LL	D.L	D.H	DO	D.H	M.H	Tare
GO	Hi.H	Lo.H	R.PV	R.RS	M.RS	PV.H	BK1	BK2	BK3
DI	RST	DO1	DO2	DO3	DO4	DI1	DI2	DI3	

### Relay Energized:

<b>HH</b>	HH Energized	<b>HI</b>	Hi Energized
<b>LO</b>	Lo Energized	<b>LL</b>	LL Energized
<b>Hi.H</b>	Hi Energized & Latch	<b>Lo.H</b>	Lo Energized & Latch
<b>DO</b>	RS485 Energized		

### Pass Code: Settable range:0000~9999;

User must key-in the exactly pass code for access to [Engineer Level]. Otherwise, the meter will return to measuring page. If user forgets the pass code, please contact with your service window.

- **Function Lock:** There are 3 levels programmable.
- **None(NonE):** no lock at all. User can access to all level for checking and setting.
- **User Level(USEr):** User Level lock. User can access to User Level for checking, but can not setting.
- **Programming Level(EnG):** Programming level lock. User can access to programming level for checking, but can not setting.
- **ALL(ALL):** All lock. User can access to all level for checking but can not setting.

## Error Message





BEFORE POWER ON, PLEASE CHECK THE SPECIFICATION AND CONNECTION AGAIN.







DISPLAY	DESCRIPTION:	REMARK
<b>ouFL</b>	Display is positive-overflow (Signal is over display range)	Please check the input signal
<b>-ouFL</b>	Display is negative-overflow (Signal is under display range)	Please check the input signal
<b>ouFL</b>	ADC is positive-overflow (Signal is higher than input 120%)	Please check the input signal
<b>-ouFL</b>	ADC is negative-overflow (Signal is lower than input -120%)	Please check the input signal
<b>EEP</b> ↔ <b>FAiL</b>	EEPROM occurs error	Please send back to manufactory for repaired
<b>AiCALG</b> ↔ <b>Pu</b>	Didn't execute the calibrate of Input Signal	Please process Calibrating Input Signal
<b>AiC</b> ↔ <b>FAiL</b>	Input signal calibrated error	Please check Calibrating Input Signal
<b>RoCALG</b> ↔ <b>Pu</b>	Didn't execute the calibrate of output Signal	Please process Calibrating Output Signal
<b>RoC</b> ↔ <b>FAiL</b>	Output Signal calibrated error	Please check Calibrating Output Signal























## ■ Operation Key:

\*Please access to the Programming Level to check and set the parameters when users start to run the meter

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

■ The meter has designed operation similar as PC's  and  and . In any page, press  key means "enter" or "confirm setting", and press  key means "escape()" or "shift".

■ In Programming Level, the screen will return to Measuring Page after do not press any key over 2 minutes, or press  for 1 second.

	Function Index	Setting Status
 (=  ) <b>Enter/Fun key</b>	(1) In any page, press  to access the level or function index (2) From the function index to access setting status	(3) Setting Confirmed, save to EEPROM and go to next function index
 (=  ) <b>Shift key</b>	(1) In measuring page, press  for 1 second to access user level. (2) In function index, press  for 1 second to go back upper level. (3) In function group index, press  for 1 second to go back measuring page	(4) In setting status, press  to Shift the setting position. (5) In setting status, press  for 1 second to abort setting and go back this function index.
 (=  ) <b>Up key</b>	(1) In function index, press  to go back to previous function index	(2) In setting status for function, press  to select function (3) During number Setting, press  can roll the digit up
 (=  ) <b>Down key</b>	(1) In Function Index Page, press  will go to the next Function Index Page.	(2) In setting status for function, press  to select function (3) During number Setting, press  can roll the digit down.

User Level

Press for 1 second to back to Measuring Page

Self-diagnosis

Display the model number

Display the software version

Ver ID: Version 1.0

MEASURING PAGE  
按1秒 → 按1秒

Enter the password to get into Engineer Level

Pass code  
Default=1000

NO

YES

Pw1: Present Value 100.00 Review only	Pw2: Present Value 100.00 Review only	rY2SP: Relay 2 Set-point setting 100.00 Settable Range: -19999~+29999	rYrSt: Reset for energized latch of Relay no YES / no	rR4I2: Maximum memorize for mathematic of PV1 and PV2 59999 Review only	rSt: Minimum storage reset no YES / no
rY1SP: Relay 1 Set-point setting 100.00 Settable Range: -19999~+29999	rYrSt: Reset for energized latch of Relay no YES / no	rR4I2: Minimum memorize for mathematic of PV1 and PV2 -1000 Review only	rSt: Minimum storage reset no YES / no	rR4I2: Maximum memorize for mathematic of PV1 and PV2 59999 Review only	rSt: Minimum storage reset no YES / no

Engineer Level

Press for 1 second to back to Measuring Page

INPUT GROUP 1 inPt1 Group FUN ENT	INPUT GROUP 2 inPt2 Group FUN ENT	RELAY GROUP rELAY Group FUN ENT	ANALOGUE OUTPUT GROUP Ao Group FUN ENT	RS485 GROUP rS485 Group FUN ENT
---	---	---------------------------------------	--	---------------------------------------

# Engineer Level

Press for 1 second to back to Measuring Page

Pass code  
Default=100  
0

INPT1	INPT2	RELAY	ANALOGUE OUTPUT GROUP	RS485 GROUP
inpt1 Group	inpt2 Group	rly5b Group	Ro Group	r5485 Group
A1-1 R1Lo: Analogue low of input 1 Settable Range: 0.00~100.00% 0.00 ↑↓	A2-1 R2Lo: Analogue low of input 2 Settable Range: 0.00~100.00% 0.00 ↑↓	rly5b: Start band for Relay energized Settable Range: 0~9999 counts 0 ↑↓	RoTYP: Analogue Output type selection 00-10 / 10-5 / R4-20 / R0-10 R4-20 ↑↓	RS485: Device number of the Settable Range: 1~255 1 ↑↓
A1-2 R1Hi: Analogue high of input 1 Settable Range: 0.00~100.00% 100.00 ↑↓	A2-2 R2Hi: Analogue high of input 2 Settable Range: 0.00~100.00% 100.00 ↑↓	rly5d: Start delay time for Relay energized Settable Range: 0:00.0~9(m):59.9(s) 00.00 ↑↓	RoLS: Analogue Low Output relative Low Scale Settable Range: -19999~+29999 000 ↑↓	bAUD: Baud rate 1200 / 2400 / 4800 / 9600 / 19200 / 38400 9600 ↑↓
A1-3 Pu1dP: Decimal Point of PV 1 0 / 00 / 0000 / 0.0000 000 ↑↓	Pu2dP: Decimal Point of PV 2 0 / 00 / 0000 / 0.0000 000 ↑↓	rly1nd: Relay 1 energized mode 0FF / Lo / Hi / LoHld / do Hi ↑↓	RoHS: Analogue High Output relative High Scale Settable Range: -19999~+29999 10000 ↑↓	PrtY: Parity 55b.1 / 55b.2 / odd / EvEn 55b.2 ↑↓
A1-4 LoSC1: Low scale of input 1 Settable Range: -19999~+29999 0.00 ↑↓	LoSC2: Low scale of input 2 Settable Range: -19999~+29999 0.00 ↑↓	rly1HY: Relay 1 Hysteresis Settable Range: 0~5000 counts 0 ↑↓	RoPzo: Fine Zero Adjustment for Analog Low Output Settable Range: -38011~+27524 0 ↑↓	
A1-5 HiSC1: High scale of input 1 Settable Range: -19999~+29999 299.99 ↑↓	HiSC2: High scale of input 2 Settable Range: -19999~+29999 299.99 ↑↓	rly1rd: Relay 1 energized delay time Settable Range: 0:00.0~9(m):59.9(s) 00.00 ↑↓	RoSPn: Fine Span Adjustment for Analog High Output Settable Range: -38011~+27524 0 ↑↓	
A1-6 Pu1P0: Fine Zero Adjustment for PV 1 display Settable Range: -19999~+29999 0.00 ↑↓	Pu2P0: Fine Zero Adjustment for PV 2 display Settable Range: -19999~+29999 0.00 ↑↓	rly1Fd: Relay 1 de-energized delay time Settable Range: 0:00.0~9(m):59.9(s) 00.00 ↑↓	P5CLR: Zero & Span Clear for Adjustment none / RoPzo / RoSPn / both none ↑↓	

Next Page

Next Page

Next Page

Next Page

A1-7	Pu1Sn Adjustment for PV 1 display Settable Range: -19999~+29999	Pu1S0 0.00	Pu2Sn Adjustment for PV 2 display Settable Range: -19999~+29999	Pu2S0 0.00	rY2nd: Relay 2 energized mode bFF / Lo / H / LoHLd / HHLd / do	rY2nd H	RoLnt: Analog Output High Limit Settable Range: 0.00~110.00%	RoLnt 110.00
A1-8	P5CL1: Clear Fine Zero & Span Adjustment for PV 1 display nonE / Pu1Po / Pu1Sn / both	P5CL1 nonE	P5CL2: Clear Fine Zero & Span Adjustment for PV 2 display nonE / Pu2Po / Pu2Sn / both	P5CL2 nonE	rY2HY: Relay 2 Hysteresis Settable Range: 0~5000 counts	rY2HY 0		
A1-9	Pu12: Math function of PV Pu1 / Pu2 / IRdd2 / ISub2 / RSub1 / InUL2 / Idw2 / Rdw1 / ErLo / ErH1	Pu12 Pu1	Pu12: Math function of PV Pu1 / Pu2 / IRdd2 / ISub2 / RSub1 / InUL2 / Idw2 / Rdw1 / ErLo / ErH1	Pu12 Pu1	rY2rd: Relay 2 energized delay time Settable Range: 0:00.0~9(m):59.9(s)	rY2rd 0.000		
A1-10	dSPLY: Display Function Pu12 / Fin12 / FR12 / FS485	dSPLY Pu12	dSPLY: Display Function Pu12 / Fin12 / FR12 / FS485	dSPLY Pu12	rY2Fd: Relay 2 de-energized delay time Settable Range: 0:00.0~9(m):59.9(s)	rY2Fd 0.000		
A1-11	LoCt1: Low Cut to show "0" for PV 1 display Settable Range: -19999~+29999	LoCt1 0.00	LoCt2: Low Cut to show "0" for PV 2 display Settable Range: -19999~+29999	LoCt2 0.00				
A1-12	RuG: Average for PV Settable Range: 1(NonE)~99times	RuG 5	RuG: Average for PV Settable Range: 1(NonE)~99times	RuG 5				
A1-13	nuRuG: Moving Average for PV Settable Range: 1(NonE)~10times	nuRuG 1	nuRuG: Moving Average for PV Settable Range: 1(NonE)~10times	nuRuG 1				
A1-14	dF:LT: Digital filter Settable Range: 0(NonE)/1~99times	dF:LT 0	dF:LT: Digital filter Settable Range: 0(NonE)/1~99times	dF:LT 0				
	Next Page		Next Page					

**A1-15** P.CoDE: Pass code setting for access Engineer Level Settable Range: 0000-9999

P.CoDE 0000

**A1-16** F.LoCk: Function level lock none / USER / ALL

F.LoCk none

**A2-15** P.CoDE: Pass code setting for access Engineer Level Settable Range: 0000-9999

P.CoDE 0000

**A2-16** F.LoCk: Function level lock none / USER / ALL

F.LoCk none

## Field Calibration Level

Measuring Page

16888

Pass Code Page

P.CoDE Enter

Pass Code for Field Calibration Level

F.CoDE Enter

YES Press **ENT**

NO

Pass code default=2000

- Once the user select field calibration, the [LoSc.1] or [LoSc.2] (step A1-4 or A2-4) and [H.Sc.1] or [H.Sc.2] (A1-5 or A2-5) will be instead of [LoSc.1] or [LoSc.2] (F2 or F7) and [H.Sc.1] or [H.Sc.2] (F4 or F9), and can not to be change. If user has to change the scaling, it's the only way to access field calibration level to set in [LoSc.1] or [LoSc.2] (F2 or F7) and [H.Sc.1] or [H.Sc.2] (F4 or F9).
- Please double check the [LoSc.1] or [LoSc.2] (step A1-4 or A2-4) and [H.Sc.1] or [H.Sc.2] (A1-5 or A2-5) are correct after selection the **OFFL** or **FELD**

**CR IL0** Adjust the structure to be a lower signal output status(or any lower status) and keep it in stable.

CR IL0: Field calibration low of input 1

88888

Press **ENT** to read signal of the lower status.

Press **ENT** again to finish the calibration lower point, and go to next page.

**LoSc.1** the value to be set is relative to Field Calibration low point of input 1

LoSc.1 88888

Press **ENT** to set the value of lower scale

**CR IH1** Adjust the structure to be a higher signal output status(or any higher status) and keep it in stable.

CR IH1: Field calibration high of input 1

88888

Press **ENT** to read signal of the higher status

Press **ENT** again to finish the calibration higher point, and go to next page.

F4  
H.5C.1  
88888  
↑ ↓

H.5C.1: the value to be set is relative to Field Calibration high point of input 1

➤ Press **ENT** to set the value of Higher scale

F5  
C.5EL.1  
dEFLd  
↑ ↓

C.5EL.1: Calibration parameter selection of input 1

➤ Press **ENT** to access the function and stand by selection

➤ Press **↵** or **⏏** to select

(default: dEFLd);

Settable: **dEFLd** / **F.iELd**

**dEFLd** (default calibration) **F.iELd** (Field calibration)

F6  
CR2Lo  
88888  
↑ ↓

Adjust the structure to be a lower signal output status(or any lower status) and keep it in stable.

CR2Lo: Field calibration low of input 2

➤ Press **ENT** to read signal of the lower status.

➤ Press **ENT** again to finish the calibration lower point, and go to next page.

F7  
Lo5C.2  
88888  
↑ ↓

Lo5C.2: the value to be set is relative to Field Calibration low point of input 2

➤ Press **ENT** to set the value of lower scale

F8  
CR2H.1  
88888  
↑ ↓

Adjust the structure to be a higher signal output status(or any higher status) and keep it in stable.

CR2H.1: Field calibration high of input 2

➤ Press **ENT** to read signal of the higher status

➤ Press **ENT** again to finish the calibration higher point, and go to next page.

F9  
H.5C.2  
88888  
↑ ↓

H.5C.2: the value to be set is relative to Field Calibration high point of input 2

➤ Press **ENT** to set the value of Higher scale

F10  
C.5EL.2  
dEFLd  
↑ ↓

C.5EL.2: Calibration parameter selection of input 1

➤ Press **ENT** to access the function and stand by selection

➤ Press **↵** or **⏏** to select


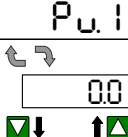
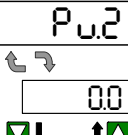
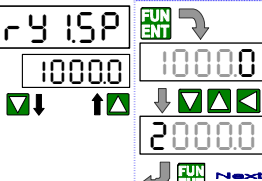




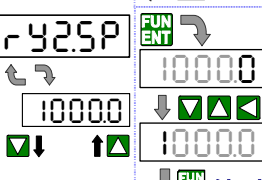




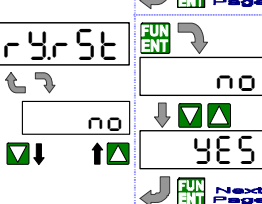







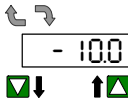
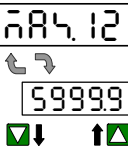
(default: dEFLd);

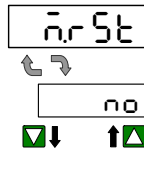
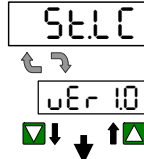
Settable: **dEFLd** / **F.iELd**

**dEFLd** (default calibration) **F.iELd** (Field calibration)



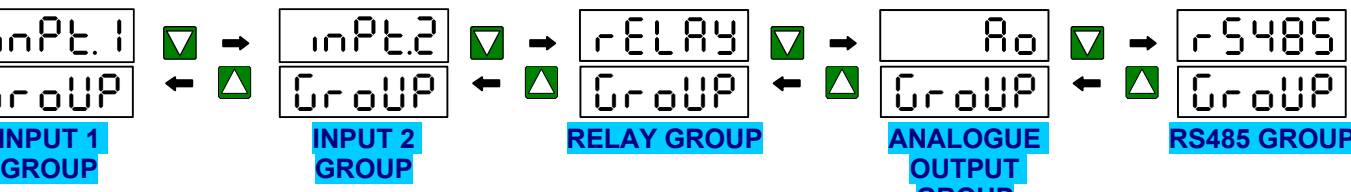





## Operating Steps

### User Level


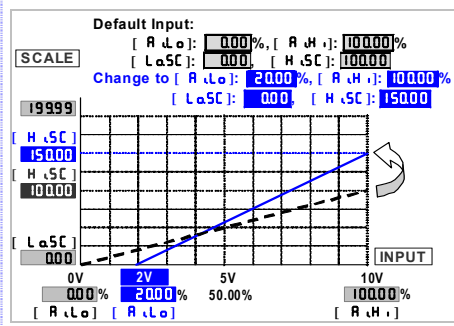
INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
POWER ON		Please check the specification and wiring diagrams firstly.	
88888	Self-diagnosis (LED All bright)		
↓			
StuA	Model		
↓			
vEr.2.0	Firmware version		
↓			
16888	Measuring Page		
Press  for 1 second return to Measuring Page			
0-1 Pu.1 	Pu.1 (PV1 disply): Present Value 1 ;	Review only	
0-2 Pu.2 	Pu.2 (PV1 disply): Present Value 2 ;	Review only	
0-3 rY1SP 	rY1SP(rY1.SP): Relay 1 Set-point setting	Settable Range: -19999~+99999  Shift  Up  Down  Enter	
0-4 rY2SP 	rY2SP(rY2.SP): Relay 2 Set-point setting	Settable Range: -19999~+99999  Shift  Up  Down  Enter	
0-5 rY.rSt 	rY.rSt(rY.rSt): Reset for energized hold of Relay: If the [rY_rSt](step B-3/7) set to be  or  , and the present value(PV) reach to the condition of relay energizing that the relay will be energized and latching. At mean time, user can reset the relay latching in here.	Programmable:  /  <b>YES (Yes):</b> reset the relay latching. <b>no (No):</b> abort to reset the relay latching.  Up  Down  Enter ※Be careful, the relay has been energizing and latching again even user had set here to reset the relay latching.. if the PV still reach to the condition of relay energized.	
0-6 n.in.12 	n.in.12 (Min.12): Miniimum storage of PV1 and PV2 with math function( Pu.12)	Review only	
0-7 n.Ax.12 	n.Ax.12 (MAX.12): Maximum storage of PV1 and PV2 with math function( Pu.12)	Review only	
Next Page			

<p>0-8</p> 	<p>M.rSt (M.rSt): reset the saved value of Maximum &amp; Minimum; The values of maximum and minimum can be reset in here. It will save newest maximum and minimum after reset.</p>	<p>Programmable: <input checked="" type="checkbox"/> YES / <input type="checkbox"/> NO YES (Yes): to reset the saved value of maximum and minimum. NO (No): abort to reset the saved values of maximum and minimum. Up Down Enter</p>
<p>0-9</p> 	<p>St.LC : Model uEr ID (Ver 1.0): Firmware version</p>	<p>Review only It will be announced in our website <a href="http://www.adtek.com.tw">www.adtek.com.tw</a>, when it had been versions updated.</p>

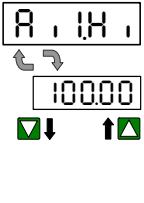
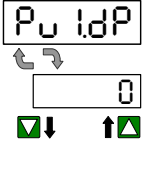
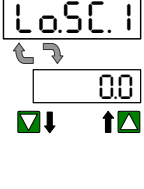
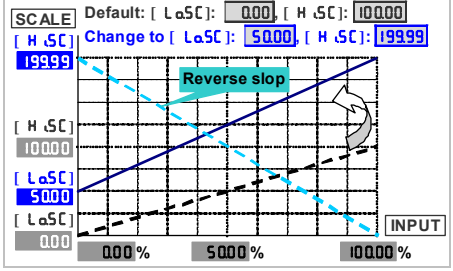
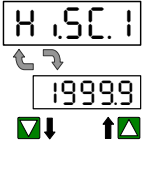
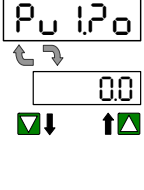
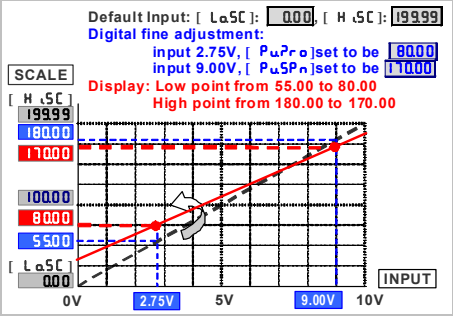
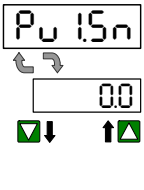
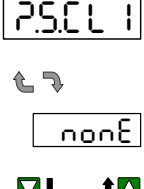
**Programming Level**

INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
16888	MEASURING PAGE		
	Enter the pass code to access Programming Level	If user wants to change the pass code, please go to step A1-15 or A2-15 to set. Please remind the new pass code.	
<p>Press  for 1second to back Measuring Page</p>			
			
<p>INPUT 1 GROUP</p> <p>PRESS  TO ACCESS</p>	<p>INPUT 2 GROUP</p> <p>PRESS  TO ACCESS</p>	<p>RELAY GROUP</p> <p>PRESS  TO ACCESS</p>	<p>ANALOGUE OUTPUT GROUP</p> <p>PRESS  TO ACCESS</p>
			<p>RS485 GROUP</p> <p>PRESS  TO ACCESS</p>

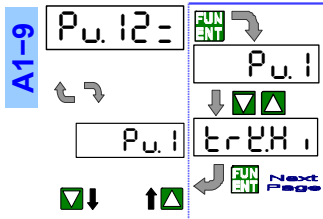
**Input 1 Group**

INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
inPt.1 GroUP	INPUT 1 GROUP INDEX PAGE		
<p>In following pages,press  for 1 second to back INPUT 1 GROUP INDEX PAGE</p>			
A1-1	<p>A.iLo (Ai1.Lo): Analogue input 1 low Please refer to the explanations in INPUT &amp; SCALING of FUNCTION DEFINE(page 1/35)</p>	<p>Settable range: 0.00%~100.00%</p> <p>Shift Up Down Enter</p> 	
Next Page			



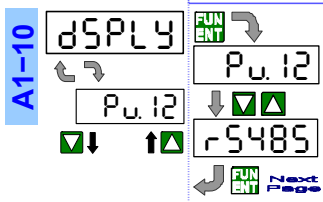
<p><b>A1-2</b></p> 	<p><b>R.H. (Ai1.Hi): Analogue input 1 high ;</b> Please refer to the explanations in <b>INPUT &amp; SCALING of FUNCTION DEFINE</b>(page 1/35)</p>	<p>Settable range: 0.00%~100.00% ◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A1-3</b></p> 	<p><b>Pv1.dP (Pv1.dP): Decimal Point of PV1 ;</b></p>	<p>Programmable: 0 / 00 / 000 / 0000 / 0.0000 ▲Up ▼Down FUN ENT Enter</p>
<p><b>A1-4</b></p> 	<p><b>Lo.SC.1 (Lo.SC.1): Low scale of input 1 ;</b> ※ If the field calibration has be done and then the [CSEL.1] selected to be <b>F.ELD</b>, the [Lo.SC.1] will be replaced by [CR.LS], and it can not be set.</p>	<p>Settable range: -19999~+29999 ◀Shift ▲Up ▼Down FUN ENT Enter</p> 
<p><b>A1-5</b></p> 	<p><b>Hi.SC.1 (Hi.SC.1): High scale of input 1 ;</b> ※ If the field calibration has be done and then the [CSEL.1] selected to be <b>F.ELD</b>, the [Hi.SC.1] will be replaced by [CR.HS], and it can not be set.</p>	<p>Settable range: -19999~+29999 ◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A1-6</b></p> 	<p><b>Pv1.Zo (Pv1.Zo): Fine Zero Adjustment for PV1 display ;</b> For Zero &amp; Span of PV, users can get the "Fine Adjustment" by front key. It's an easy way to "Just Key-In" the value that the user wants to show in the current input signal. Especially, the [Pv1.Zo] &amp; [Pv1.Sn] are not only in zero &amp; span of PV, but also any lower point for [Pv1.Zo] &amp; higher point for [Pv1.Sn]. The meter will be linear for full scale.</p>	<p>Settable range: -19999~+29999 ◀Shift ▲Up ▼Down FUN ENT Enter</p> 
<p><b>A1-7</b></p> 	<p><b>Pv1.Sn (Pv1.Sn): Fine Span Adjustment for PV1 display ;</b> It's same function as like as [Pv1.Zo]</p>	<p>Settable range: -19999~+29999 ◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A1-8</b></p> 	<p><b>Z.S.CL1 (Z.S.CL1): Clear Fine Zero &amp; Span Adjustment for PV1 display ;</b></p>	<p>Programmable: none (None): Do not clear the fine adjustment of Low / High for PV1. Pv1.Zo (PV1.Zro): To clear the fine adjustment Low for PV1. Pv1.Sn (PV1.SPn): To clear the fine adjustment High for PV1 both (PV1 Zero &amp; Span): To clear the fine adjustment of Low and High for PV1. ▲Up ▼Down FUN ENT Enter</p>

Next Page



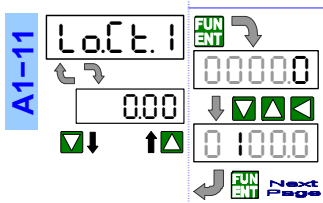
**Pu.12= (Pv.12=):** Mathematic function for display ;

**Programmable:**  
**Pu.1 (PV1):** Show PV1  
**Pu.2 (PV2):** Show PV2  
**[Add2] (1 Add 2):** Show PV1+PV2  
**[Sub2] (1 Subtraction 2):** Show PV1-PV2  
**[2Sub1] (2 Subtraction 1):** Show PV2-PV1  
**[Mul2] (1 Multiplication 2):** Show PV1×PV2  
**[Div2] (1 divide 2):** Show PV1÷PV2  
**[2Div1] (2 divide 1):** Show PV2÷PV1  
**[TrLo] (Tracking low):** Show tracking low.If PV1<PV2, show PV1; if PV2<PV1, show PV2.  
**[TrHi] (Tracking High):** Show tracking high.If PV1>PV2, show PV1; if PV2>PV1, show PV2.  
**▲Up ▼Down [FUN ENT]Enter**



**dSPly (dSPly):** Display Function ;  
 When the [dSPly] function set to be [5485], At meantime, the input signal (PV) no longer display now. The PV screen will show the number from RS485 command & data directly. The data(number) will be same as PV that it will compare with set-point and analogue output are correspondent to control analogue output, relay energized and so on.

**Programmable:**  
**Pu.12 (PV.12):** Show PV.12  
**[Min.12] (Min.12):** Minimum Hold of PV.12  
**[MAX.12] (MAX.12):** Maximum Hold of PV.12  
**[5485] (RS485):** Remote displayed from RS485 command of master.  
**▲Up ▼Down [FUN ENT]Enter**



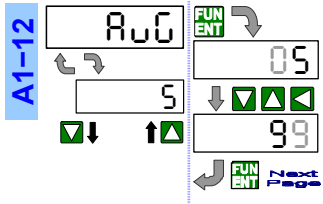
**Lo.Ct.1 (Lo.Ct.1):** Low Cut for PV1 display ;

Low Cut is set for 0.50, if the PV is from -0.50~+0.50, that display will be 0.

**Settable range:**  
 -19999~+19999 counts

Low Cut is set for -0.10, if the PV is under ( $\leq -0.10$ ), that display will be -0.10.

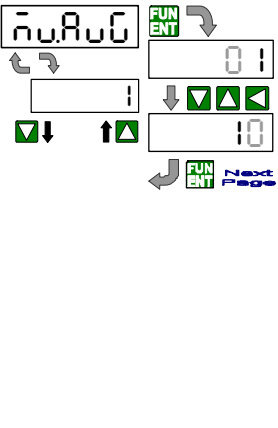
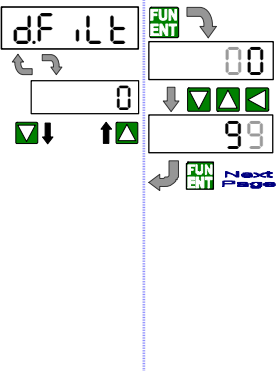
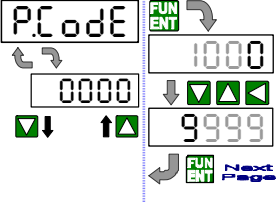
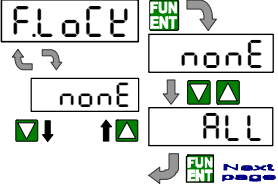
**◀Shift ▲Up ▼Down [FUN ENT]Enter**



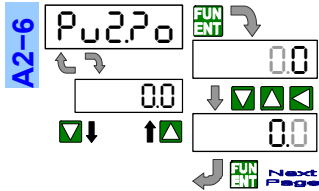
**RUG (AVG):** Average ;  
 The meter's sampling is 15cycle/sec  
 If the [RUG](Average) set to be [3] to express the display update with 5 times/sec.The meter will calculate the sampling 1-3 and update the display value. At meantime, the sampling 4-6 will be processed to calculate.

**Settable range:**  
 1(no function)~99 times  
**◀Shift ▲Up ▼Down [FUN ENT]Enter**

Next Page

A1-13		<p><b>Mv.AVG (Mv.AVG): Moving Average ;</b></p> <p>The meter's sampling is 15cycle/sec. If the [Mv.AVG](Moving Average) set to be expressed the display update with 15 times/sec.</p> <p>In the first updated display value will be same as average function. In the next updated display value, the function will get the new fourth sample (sample 4) then throw away the first sample (sample 1) that the newest 3 samples (sample 2,3,4) will be calculated for the updated display value.</p>	<p><b>Settable range:</b> 0(no function)/1~10 times;</p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
A1-14		<p><b>dF .LT (d.FiLt): Digital filter ;</b></p> <p>The digital filter can reduce the influence of spark noise by magnetic of coil.</p> <p>If the values of samples are over digital filter band(fixed in firmware and about 5% of stable reading) 3 times (Digital Filter set to be 3) continuously, the meter will admit the samples and update the new reading. Otherwise, it will be as treat as a noise and skip the samples.</p>	<p><b>Settable range:</b> 0(no function)/1~99 times.</p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
A1-15		<p><b>P.CodE (P.CoDE): Pass Code ;</b></p> <p>Please remind and write down the new pass code so that access to programming level.</p>	<p><b>Settable range: 0000~9999</b></p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
A1-16		<p><b>F.LoCk (F.LoCK): Function Lock ;</b></p> <p>There are 4 levels programmable for lock that the function is to avoid miss-setting.</p>	<p><b>Programming:</b></p> <p><b>nonE (None):</b> no lock at all. User can access to user level for checking and setting.</p> <p><b>USEr (User Level):</b> User level lock. User can access to user level for checking, but can not setting.</p> <p><b>EnG (Programming Level):</b> Programming level lock. User can access to programming level for checking, but can not setting.</p> <p><b>ALL (All Level):</b> All lock. User can access to all level for checking, but can not setting.</p> <p>▲Up ▼Down FUN ENT Enter</p>



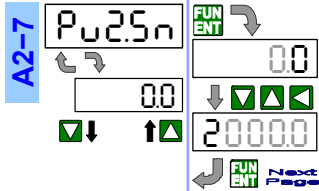
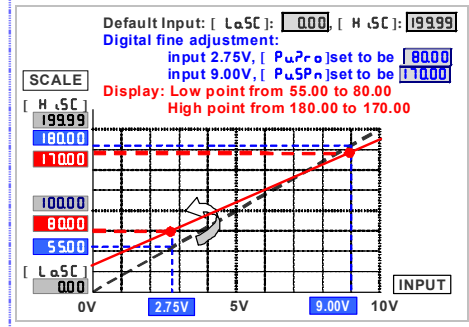


**Pu2Zo (Pv2.Zo): Fine Zero Adjustment for PV1 display ;**

For Zero & Span of PV, users can get the "Fine Adjustment" by front key. It's an easy way to "Just Key-In" the value that the user wants to show in the current input signal. Especially, the [Pu2Zo] & [Pu2Sn] are not only in zero & span of PV, but also any lower point for [Pu2Zo] & higher point for [Pu2Sn]. The meter will be linear for full scale.

**Settable range: -19999~+29999**

**◀Shift ▲Up ▼Down FUN ENT Enter**

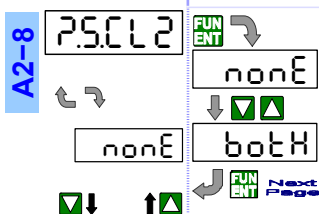


**Pu2Sn (Pv2.Sn): Fine Span Adjustment for PV1 display ;**

It's same function as like as [Pu2Zo]

**Settable range: -19999~+29999**

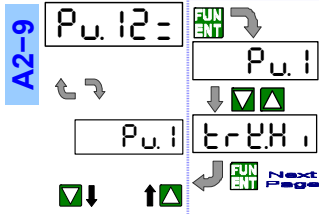
**◀Shift ▲Up ▼Down FUN ENT Enter**



**P5CL2 (Z.S.CL2): Clear Fine Zero & Span Adjustment for PV2 display ;**

**Programmable:**

- nonE (None):** Do not clear the fine adjustment of Low / High for PV2.
  - Pu2Zo (PV2.Zro):** To clear the fine adjustment Low for PV1.
  - Pu2Sn (PV2.SPn):** To clear the fine adjustment High for PV2
  - botH (PV2 Zero & Span):** To clear the fine adjustment of Low and High for PV2.
- ▲Up ▼Down FUN ENT Enter**

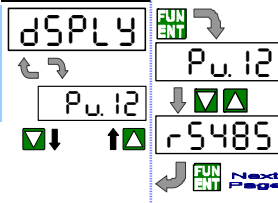
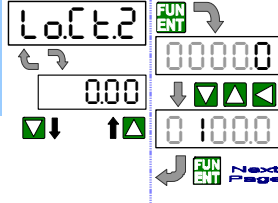
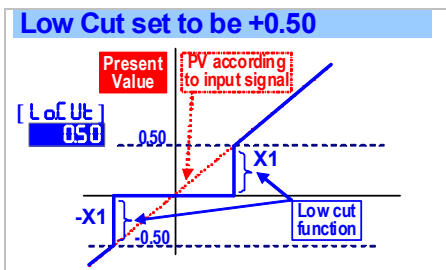
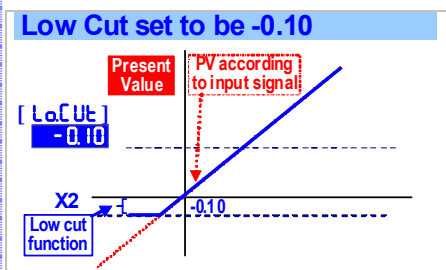
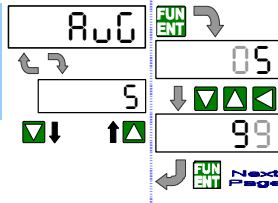
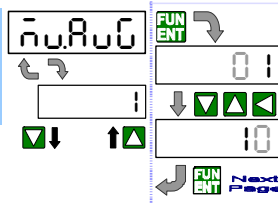
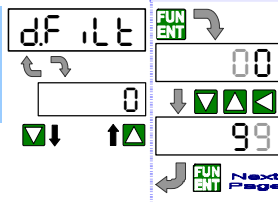


**Pu12= (Pv.12=): Mathematic function for display ;**

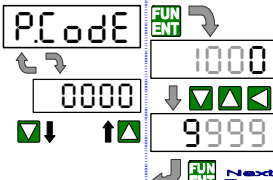
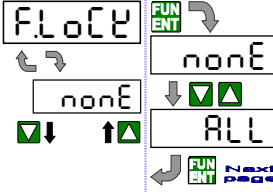
**Programmable:**

- Pu.1 (PV1):** Show PV1
  - Pu.2 (PV2):** Show PV2
  - 1Add2 (1 Add 2):** Show PV1+PV2
  - 1Sub2 (1 Subtraction 2):** Show PV1-PV2
  - 2Sub1 (2 Subtraction 1):** Show PV2-PV1
  - 1Mul2 (1 Multiplication 2):** Show PV1×PV2
  - 1d.2 (1 divide 2):** Show PV1÷PV2
  - 2d.1 (2 divide 1):** Show PV2÷PV1
  - ErL0 (Tracking low):** Show tracking low.If PV1<PV2, show PV1; if PV2<PV1, show PV2.
  - ErH1 (Tracking High):** Show tracking high.If PV1>PV2, show PV1; if PV2>PV1, show PV2.
- ▲Up ▼Down FUN ENT Enter**


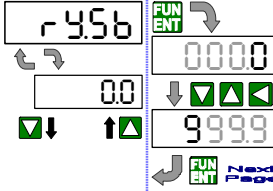
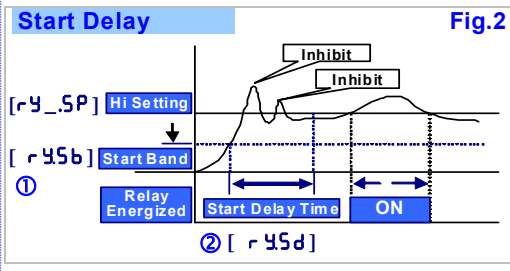
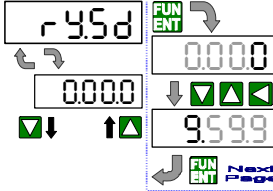
Next Page

<p><b>A2-10</b></p> 	<p><b>dSPly (dSPly): Display Function ;</b></p> <p>When the [dSPly] function set to be [RS485], At meantime, the input signal (PV) no longer display now. The PV screen will show the number from RS485 command &amp; data directly. The data(number) will be same as PV that it will compare with set-point and analogue output are correspondent to control analogue output, relay energized and so on.</p>	<p><b>Programmable:</b></p> <p><b>PV.12 (PV.12):</b> Show PV.12</p> <p><b>Min.12 (Min.12):</b> Minimum Hold of PV.12</p> <p><b>MAX.12 (MAX.12):</b> Maximum Hold of PV.12</p> <p><b>RS485 (RS485):</b> Remote displayed from RS485 command of master.</p> <p>▲Up ▼Down FUN ENT Enter</p>
<p><b>A2-11</b></p> 	<p><b>Lo.Ct.2 (Lo.Ct.2): Low Cut for PV2 display ;</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Low Cut set to be +0.50</b></p>  <p>Low Cut is set for 0.50, if the PV is from -0.50~+0.50, that display will be 0.</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>Low Cut set to be -0.10</b></p>  <p>Low Cut is set for -0.10, if the PV is under (<math>\leq -0.10</math>), that display will be -0.10.</p> </div>	<p><b>Settable range:</b></p> <p><b>-19999~+19999 counts</b></p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A2-12</b></p> 	<p><b>AvG (AvG): Average ;</b></p> <p>The meter's sampling is 15cycle/sec. If the [AvG](Average) set to be [3] to express the display update with 5 times/sec. The meter will calculate the sampling 1-3 and update the display value. At meantime, the sampling 4-6 will be processed to calculate.</p>	<p><b>Settable range:</b></p> <p><b>1(no function)~99 times</b></p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A2-13</b></p> 	<p><b>Mv.AvG (Mv.AvG): Moving Average ;</b></p> <p>The meter's sampling is 15cycle/sec. If the [Mv.AvG](Moving Average) set to be [1] expressed the display update with 15 times/sec.</p> <p>In the first updated display value will be same as average function. In the next updated display value, the function will get the new fourth sample (sample 4) then throw away the first sample (sample 1) that the newest 3 samples (sample 2,3,4) will be calculated for the updated display value.</p>	<p><b>Settable range:</b></p> <p><b>0(no function)/1~10 times;</b></p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>
<p><b>A2-14</b></p> 	<p><b>d.Filt (d.Filt): Digital filter ;</b></p> <p>The digital filter can reduce the influence of spark noise by magnetic of coil.</p> <p>If the values of samples are over digital filter band(fixed in firmware and about 5% of stable reading) 3 times (Digital Filter set to be 3) continuously, the meter will admit the samples and update the new reading. Otherwise, it will be as treat as a noise and skip the samples.</p>	<p><b>Settable range:</b></p> <p><b>0(no function)/1~99 times.</b></p> <p>◀Shift ▲Up ▼Down FUN ENT Enter</p>

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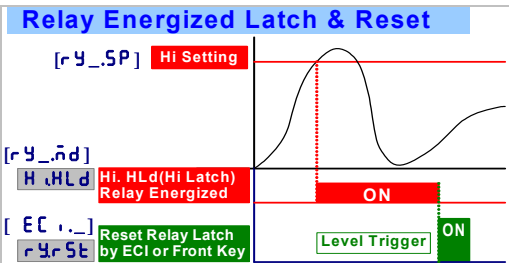
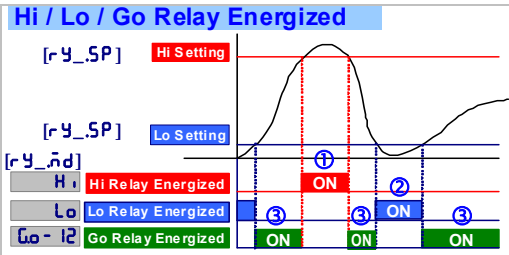
<p>A2-15</p> 	<p><b>P.CodE (P.CodE): Pass Code ;</b> Please remind and write down the new pass code so that access to programming level.</p>	<p>Settable range: 0000~9999  <input type="checkbox"/>Shift <input type="checkbox"/>Up <input type="checkbox"/>Down <input type="checkbox"/>Enter</p>
<p>A2-16</p> 	<p><b>F.LoCk (F.LoCk): Function Lock) ;</b> There are 4 levels programmable for lock that the function is to avoid miss-setting.</p>	<p><b>Programming:</b>  <input type="checkbox"/>nonE(<b>None</b>): no lock at all. User can access to user level for checking and setting.  <input type="checkbox"/>USEr(<b>User Level</b>): User level lock. User can access to user level for checking, but can not setting.  <input type="checkbox"/>EnG(<b>Programming Level</b>): Programming level lock. User can access to programming level for checking, but can not setting.  <input type="checkbox"/>ALL(<b>All Level</b>): All lock. User can access to all level for checking, but can not setting.</p> <p><input type="checkbox"/>Up <input type="checkbox"/>Down <input type="checkbox"/>Enter</p>

■ RELAY GROUP (The group will not be displayed except the relay function is to be specified)

INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
<p>rELAY GrOUP</p> 	<p>RELAY GROUP INDEX PAGE</p>		
<p>In following pages,press <input type="checkbox"/> for 1 second to back RELAY GROUP INDEX PAGE</p>			
<p>B-1</p> 	<p><b>rY.Sb (rY.Sb): Start band of Relay Output</b> After PV surpasses start band, when again after start delay time, the relay will only then start the PV and the setting value does quite outputs.</p> 	<p>Settable range: 0~9999 counts  <input type="checkbox"/>Shift <input type="checkbox"/>Up <input type="checkbox"/>Down <input type="checkbox"/>Enter</p>	
<p>B-2</p> 	<p><b>rY.Sd (rY.Sd): Relay Output start delay time</b></p>	<p>Settable range: 0:00.0~9(M):59.9(S)  <input type="checkbox"/>Shift <input type="checkbox"/>Up <input type="checkbox"/>Down <input type="checkbox"/>Enter</p>	
<p>Next Page</p>			

B-3

rY lnd (rY1.Md): Relay 1 energized mode



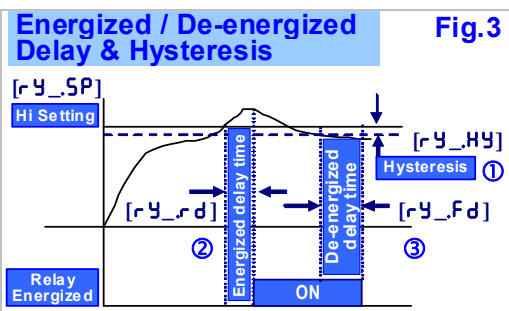
Programmable:

- (Turn off the Relay) : Turn off the Relay and indication LED.
- (Low Level Energized) : Low Level Energized; Relay will energize when PV < Set-Point.
- (High Level Energized) : High Level Energized; Relay will energize when PV > Set-Point.
- /  (High / Low Level energized hold) : High / Low Level energize and latch; As the PV Higher (or lower) than set-point, the relay will be energized to latch except manual reset by from key in [User Level].
- (Digital Output) : Digital Output; Relay is energized by RS485 command directly, but no longer to compare with set-point of relay.

Enter

B-4

rY lHY (rY1.HY): Relay 1 Hysteresis



Settable range: 0~5000 counts  
    Enter

B-5

rY lr d (rY1.rd): Relay 1 energized delay time

Settable range:  
 0:00.0~9(M):59.9(S)  
    Enter

B-6

rY lF d (rY1.Fd): Relay 1 de-energized delay time

Settable range:  
 0:00.0~9(M):59.9(S)  
    Enter

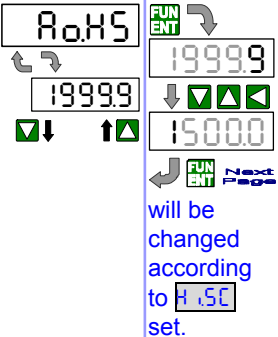
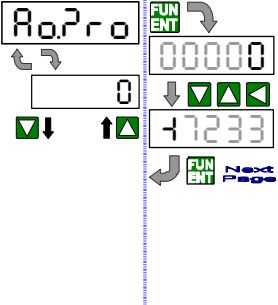
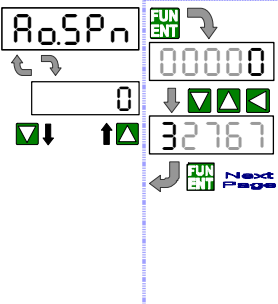
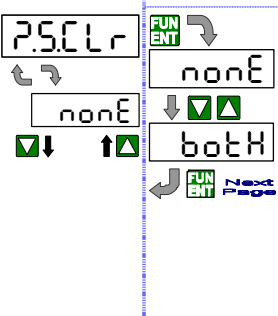
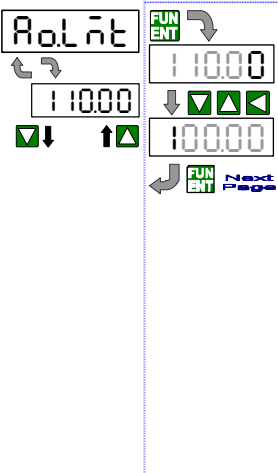
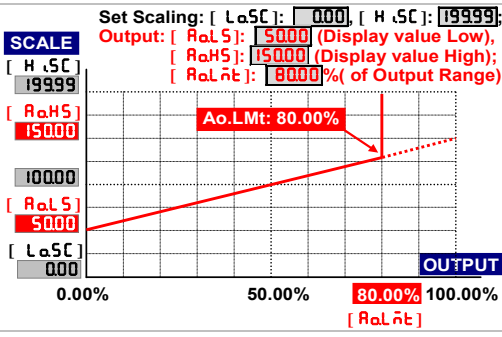
Next Page



B-7		rY2.nD (rY2.Md): Relay 2 energized mode	.... as same as Relay 1 Energized Mode... <b>Programmable:</b> oFF(off) / Lo(Lo) / Hi(Hi) / H.HLd(Hi.HLd) / LoHLd(Lo.HLd) / do(DO) ▲Up ▼Down FUN ENT Enter
B-8		rY2.HY (rY2.HY): Relay 2 Hysteresis	<b>Settable range: 0~5000 counts</b> ◀Shift ▲Up ▼Down FUN ENT Enter
B-9		rY2.rD (rY2.rD): Relay 2 energized delay time	<b>Settable range: 0:00.0~9(M):59.9(S)</b> ◀Shift ▲Up ▼Down FUN ENT Enter
B-10		rY2.FD (rY2.FD): Relay 2 de-energized delay time	<b>Settable range: 0:00.0~9(M):59.9(S)</b> ◀Shift ▲Up ▼Down FUN ENT Enter

**ANALOGUE GROUP (The group will not be displayed except the relay function is to be specified)**

INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
Ao Group FUN ENT ↓	ANALOGUE GROUP INDEX PAGE		
In following pages, press ◀ for 1 second to back ANALOGUE GROUP INDEX PAGE			
D-1		<b>Ra.tYP (Ao.tYP): Analogue Output type</b> Analogue output type had been fixed in mA or V as customer ordering requested. Therefore, the type selection is only for the ranges in same type(Voltage or Current)	<b>Programmable:</b> <b>Voltage Output:</b> u0-10(0~10V) / u0-5(0~5V) / u.1-5(1~5V) <b>Current Output:</b> R0-10(0~10mA) / R0-20(0~20mA) / R4-20(4~20mA) ▲Up ▼Down FUN ENT Enter
D-2		<b>Ra.L5 (Ao.LS): Analogue Output relative Low Scale</b> To set the lower display value versus low output range (as like as 4mA in R4-20) Ex. Output range set to be R4-20 (4~20mA) is relative to display 0~199.99. User can set the [Ra.L5] (Ao.LS) to be 5000. At meantime, the output signal will be 4mA when the present value is 50.00.	<b>Settable range: -19999~29999</b> ◀Shift ▲Up ▼Down FUN ENT Enter 
<b>Next Page</b>			

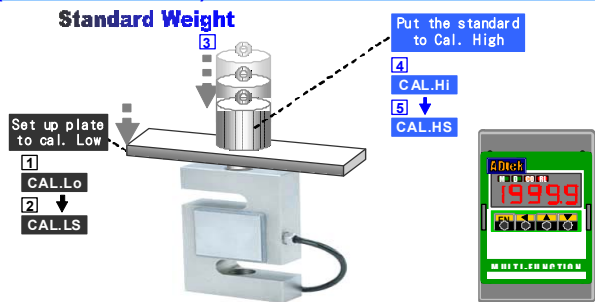
<p><b>D-3</b></p> 	<p><b>RαHS (Ao.HS): Analogue Output relative High Scale</b></p> <p>To set the higher display value versus high output range (as like as 20mA in <b>R4-20</b>) Ex. Output range set to be <b>R4-20</b> (4~20mA) is relative to display 0~199.99. User can set the [ <b>RαHS</b> ] (Ao.HS) to be <b>15000</b>. At meantime, the output signal will be 20mA when the present value(PV) is 150.00.</p> <p>will be changed according to <b>H.SL</b> set.</p>	<p><b>Settable range: -19999~29999</b></p> <p>◀Shift ▲Up ▼Down <b>FUN ENT</b> Enter</p>	
<p><b>D-4</b></p> 	<p><b>RαZro (Ao.Zro): Fine Zero Adjustment for Analog Output</b></p> <p>Users can get Fine zero Adjustment for analogue output by front key. Please connect standard meter to the terminal of analogue output for measuring the output value. To press the front key(up or down key) to adjust and check the output of meter.</p>	<p><b>Settable range: -38011~+27524</b></p> <p>◀Shift ▲Up ▼Down <b>FUN ENT</b> Enter</p>	
<p><b>D-5</b></p> 	<p><b>RαSPn (Ao.SPn)Fine Span Adjustment for Analog Output</b></p> <p>Users can get Fine span Adjustment for analogue output by front key of the meter as like as [ <b>RαZro</b> ] (Ao.Zro).</p>	<p><b>Settable range: -38011~+27524</b></p> <p>◀Shift ▲Up ▼Down <b>FUN ENT</b> Enter</p>	
<p><b>D-6</b></p> 	<p><b>P5CLr (Z.S.CLr)Clear Fine Zero / Span Adjustment for Analog Output</b></p>	<p><b>Programmable:</b></p> <p><b>nonE</b>(None): Do not clear <b>RαZro</b>(Ao.Zro): Clear low adjust <b>RαSPn</b>(Ao.SPn): Clear high adjust <b>botH</b>(both): Clear low &amp; high adjust</p> <p>▲Up ▼Down <b>FUN ENT</b> Enter</p>	
<p><b>D-7</b></p> 	<p><b>RαLnt (Ao.LMt): Analog Output High Limit</b></p>	<p><b>Settable range: 0.00~110.00% of FS</b></p> <p>◀Shift ▲Up ▼Down <b>FUN ENT</b> Enter</p>	 <p>Set Scaling: [ <b>LαSC</b> ]: 000, [ <b>H.SC</b> ]: 19999; Output: [ <b>RαLS</b> ]: 5000 (Display value Low); [ <b>RαHS</b> ]: 15000 (Display value High); [ <b>RαLnt</b> ]: 8000 (% of Output Range)</p> <p><b>SCALE</b> [ <b>H.SC</b> ] 19999 [ <b>RαHS</b> ] 15000 10000 [ <b>RαLS</b> ] 5000 [ <b>LαSC</b> ] 000</p> <p><b>OUTPUT</b> 0.00% 50.00% 80.00% 100.00% [ <b>RαLnt</b> ]</p>

■ RS485 GROUP(The group will not be displayed except the relay function is to be specified)

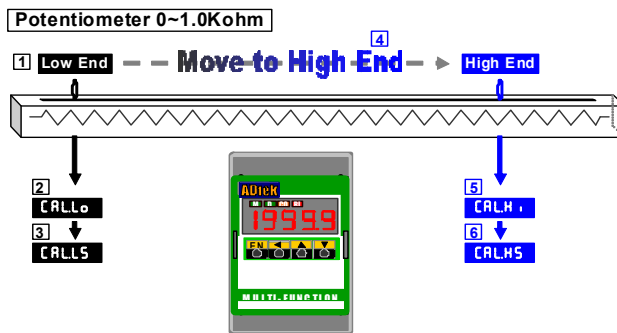
INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
RS485 GROUP FUN ENT ↓	ANALOGUE GROUP INDEX PAGE		
In following pages,press ◀ for 1 second to back RS485 GROUP INDEX PAGE			
E-1 AdRES FUN ENT ↻ 001 ↓ ↑ 255 FUN ENT ↻ Next Page	AdRES (AdRES): Device number of the meter	Settable range: 1~255 ◀Shift ▲Up ▼Down FUN ENT Enter	
E-2 bAUd FUN ENT ↻ 9600 9600 ↓ ↑ 38400 FUN ENT ↻ Next Page	bAUd (bAUd): Baud rate	Programmable: 1200 / 2400 / 4800 / 9600 / 19200 / 38400 ▲Up ▼Down FUN ENT Enter	
E-3 Pr itY FUN ENT ↻ nStb2 nStb2 ↓ ↑ EvEn FUN ENT ↻ Next Page	Pr itY (PritY): Parity	Programmable: nStb.1(n.Stb.1): None, 1 stop bit nStb.2(n.Stb.2): None, 2 stop bit odd(odd): odd EvEn(EvEn): Even ▲Up ▼Down FUN ENT Enter	

**Field Calibration Group**

Please according to the sequence to do the Field Cal. (1 → 2 → 3 → 4 → 5)



Please according to the numbers to do the field calibration (1 → 2 → 3 → 4 → 5 → 6)



INDEX	FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
16888	Measuring Page		
EntEr	Pass Code Page		
P.CodE			
EntEr	Pass Code for Field Calibration Level	Enter the exactly pass code of the meter to access the Field Calibration Level. Otherwise, it will be turning back to measuring page.	
0000			
2000			
2000			
NO			
Pass Code			
YES			
Adjust the structure of machinery of input 1 to the lower signal output status(or any lower status).			
F-1	<p><b>CA1Lo (CA1.Lo): Field Calibration Low of input 1</b></p> <p>The low calibration is not need the exactly "zero" to calibrate because of the "field calibration" function could be calibrate any lower point.</p>	<p>Waiting for the value till stable, pressed <b>FUN ENT</b> Key to read signal low of sensing device.</p> <p>Waiting for above reading stable (around 3~5seconds), press <b>FUN ENT</b> Key again to complete the calibration lower point, and go to [LoSC.1].</p>	
F-2	<p><b>LoSC.1 (Lo.SC.1): Low Scale relative Field Calibration Low of input 1</b></p>	<p>Settable range: -19999~29999</p> <p><b>Shift Up Down Enter</b></p>	
Adjust the structure of machinery of input 1 to the higher signal output status(or any higher status).			
F-3	<p><b>CA1Hi (CA1.Hi): Field Calibration High of input 1</b></p> <p>The high calibration is not need the exactly "span" to calibrate because of the "field calibration" function could be calibrating any higher point.</p>	<p>Waiting for the value till stable, pressed <b>FUN ENT</b> Key to read signal high of sensing device.</p> <p>Waiting for above reading stable (around 3~5seconds), press <b>FUN ENT</b> Key again to complete the calibration higherer point, and go to [HiSC.1].</p>	
Next Page			

F-4		<b>H .SC.1 (Hi.SC.1): High Scale relative Field Calibration High of input 1</b>	<b>Settable range: -19999~29999</b> 
F-5		<b>C.SEL.1 (C.SEL.1): Calibration parameter selection of input 1</b> As the user finished the procedures of field calibration, the field calibration datum has been saved in EEPROM and it can't change the default(factory) calibration datum. Even the field calibration has been done, the user can still select either default calibration or field calibration.	<b>Programmable:</b> <b>dEFLt</b> (default): factory calibration points and factors <b>F.iELd</b> (field): field calibration points and factors <ul style="list-style-type: none"> <li>▶ If the user select field calibration of the [LoSC.1] (step A1-4) and [H .SC.1] (step A1-5) will be replaced by the [RLLS] and [RLHS] which it can not to be change by anyone. If user has to change the scaling, it's the only way to access field calibration level to set in [LoSC.1] (step F-2) and [H .SC.1] (step F-4).</li> <li>▶ Please double check the [LoSC.1] (step A1-4) and [H .SC.1] (A1-5) whether are correct after selection the <b>dEFLt</b> or <b>F.iELd</b>.</li> </ul>
<b>Adjust the structure of machinery of input 2 to the lower signal output status(or any lower status).</b>			
F-6		<b>CA2Lo (CA2.Lo): Field Calibration Low of input 2</b> The low calibration is not need the exactly "zero" to calibrate because of the "field calibration" function could be calibrate any lower point.	<ul style="list-style-type: none"> <li>▶ Waiting for the value till stable, pressed  Key to read signal low of sensing device.</li> <li>▶ Waiting for above reading stable (around 3~5seconds), press  Key again to complete the calibration lower point, and go to [LoSC.2].</li> </ul>
F-7		<b>LoSC.2 (Lo.SC.2): Low Scale relative Field Calibration Low of input 2</b>	<b>Settable range: -19999~29999</b> 
<b>Adjust the structure of machinery of input 2 to the higher signal output status(or any higher status).</b>			
F-8		<b>CA2Hi (CA2.Hi): Field Calibration High of input 2</b> The high calibration is not need the exactly "span" to calibrate because of the "field calibration" function could be calibrating any higher point.	<ul style="list-style-type: none"> <li>▶ Waiting for the value till stable, pressed  Key to read signal high of sensing device.</li> <li>▶ Waiting for above reading stable (around 3~5seconds), press  Key again to complete the calibration higher point, and go to [H .SC.2].</li> </ul>
F-9		<b>H .SC.2 (Hi.SC.2): High Scale relative Field Calibration High of input 2</b>	<b>Settable range: -19999~29999</b> 
<b>Next Page</b>			

**CSEL2 (C.SEL.2): Calibration parameter selection of input 2**

As the user finished the procedures of field calibration, the field calibration datum has been saved in EEPROM and it can't change the default(factory) calibration datum. Even the field calibration has been done, the user can still select either default calibration or field calibration.

**Programmable:**

**DEFLE**(default): factory calibration points and factors

**FIELD**(field): field calibration points and factors

**▲Up ▼Down FUN ENT Enter**

- ▶ If the user select field calibration of the [L0SC2] (step A2-4) and [H1SC2] (step A2-5) will be replaced by the [RLLS] and [RLHS] which it can not to be change by anyone. If user has to change the scaling, it's the only way to access field calibration level to set in [L0SC2] (step F-7) and [H1SC2] (step F-9).
- ▶ Please double check the [L0SC2] (step A2-4) and [H1SC2] (A2-5) whether are correct after selection the **DEFLE** or **FIELD**.

[Go back to Measuring Page](#)

## TROUBLE SHOOTING

Display Issue:		
PROBLEM	CHECKING LIST	REMEDY
<b>Display shows</b> <div style="display: flex; gap: 10px;"> <div style="border: 1px solid black; padding: 2px;">ouFL</div> <div style="border: 1px solid black; padding: 2px;">-ouFL</div> </div>	1.To inspect whether did the input signal type (V/A/mA..) of meter match with field signal or not?	Please change another meter that is matching in the field.
	2.To inspect whether the input signal is over +120% (input high limit) or -120% (input low limit)?	<b>A.</b> Please check the [RL0] and [RH1] in [INPUT GROUP] are correct or not. <b>B.</b> Please changes another meter that is matching in the field.
	3. To inspect whether did the wires connect correct and secure or not?	<b>A.</b> Please checks carefully the connection diagram of label on the meter. <b>B.</b> Please uses the terminals(Y, Ring or cord end terminal) to avoid the risk of insecure.
<b>Incorrect ion display value or out of accuracy</b>	1. To inspect the input signal type (V/A/mA..) or range of meter whether did match with signal in the field or not?	Please changes another meter that is matching in field.
	2.To inspect the settings of analogue input high and low whether did it correct or not?	Please check the [RL0] and [RH1] in the [INPUT GROUP] whether did the both set correct or not? Generally, the [RL0] is 000% and [RH1] is 10000%, if the input specification of meter is same as range of signal in field.
	3.To inspect the settings of high and low scale whether did it correct or not?	Please check the [H1SC](A1-5 or A2-5) and [L0SC](A1-4 or A2-4) in [INPUT GROUP].
	4.To inspect the high and low fine adjustments of PV are changed or not?	Please check the [PUSPn](A1-7 or A2-7) and [PUPRo](A1-6 or A2-6) in [INPUT GROUP] whether did the values can be cleared in [PCLR](A1-8 or A2-8).
	5.To inspect the field calibration whether did it match with sensor in the field or not?	Please check the [RLLS](F-2 or F-7) and [RLHS](F-4 or F-9) both are matched the measuring range of sensor.

<b>Jittery Display</b>	1.To inspect the input signal is jittery or not?	<p><b>A.</b>If the input signal is jittery continuously, please set higher value in [ R0G](A1-12 or A2-12) or [n0R0G](A1-13 or A2-13)</p> <p><b>B.</b>If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in [dF 0L0](A1-14 or A2-14)</p> <p><b>C.</b>Please does not lay the wires of input together with high-voltage lines or power lines. As a general rule, wire the meter in a separate system, use an independent metal conduit, or use shielded cable.</p>
	2.To inspect the input signal is stable.	<p><b>A.</b>If the input signal is jittery continuously, please set higher value in [ R0G](A1-12 or A2-12) or [n0R0G](A1-13 or A2-13)</p> <p><b>B.</b>If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in [dF 0L0](A1-14 or A2-14)</p> <p><b>C.</b>Please connects an isolation transformer as close as meter in power lines.</p>
<b>Display shows "-----"</b>	To inspect display function [d5PL0]. It's maybe to be set to [5485]	Please check the [d5PL0](A1-10 or A2-10) in [ 0NPUT GR0UP] and change the function setting from [5485] to [ P0].
<b>Display value doesn't change</b>	To inspect display function [d5PL0]. It's maybe to be set to [nR0H0](maximum hold) or [0nH0](minimum hold), and the M.H LED is brighten.	Please check the [d5PL0](A1-10 or A2-10) in [ 0NPUT GR0UP] and change the function set from [nR0H0] or [0nH0] to [ P0].

<b>Relay Output Issue:</b>		
<b>PROBLEM</b>	<b>CHECKING LIST</b>	<b>REMEDY</b>
<b>The parameters of Relay doesn't shown</b>	Check if the label of meter for detail specification.	<p><b>A.</b>Please check the product number and output(O/P:_____) description again for confirmation the relay output is specified or not?</p> <p><b>B.</b>Please send back to our sales window, or order another meter with relay function.</p>
<b>Relay cans not action.</b>	<b>The relay energized, but square red LED doesn't bright</b>	
	1.Check the energized mode	Please check the [0Y0d](B-3/7) in the [RELAY GR0UP]
	2.Check the delay time and delay band in the start delay function.	Please check whether the [0Y5b] (B-1) did is too wide and [0Y5d](B-2) is too long in [RELAY GR0UP] or not?
	3. Check the energized delay time	Please check whether did the [0Y0d](B-5/9) is too long in [RELAY GR0UP] or not?
	<b>The relay energized, but square red LED dose bright</b>	
1.Check the wiring of relay output	According to the label of meter, please check again the connection wire of relay. Be careful to check the number of relay is matching the setting.	
2.Check the voltage of supply power		

<b>Analogue Output Issue:</b>		
<b>PROBLEM</b>	<b>CHECKING LIST</b>	<b>REMEDY</b>
<b>Incorrect ion analogue output value or out of accuracy</b>	1. To inspect the output signal type (V/A/mA..) or range of meter whether did match with signal in the field or not?	<p><b>A.</b>Please check the product number and output(O/P:_____) description again for confirmation the analogue output is specified or not? If it was not specified, please send back to our sales window, or order another product with relay function.</p> <p><b>B.</b>Please confirm the output type is correct and check the range in [R00YP](D-1) of [ R0 GR0UP]</p>
	2. Check the Analogue output high and low setting.	<b>A.</b> Please check the [ R0L5](D-2) and [ R0H5](D-3) in [ R0 GR0UP].
<b>Jittery</b>	<b>Analogue output is according to the display</b>	

<b>Analogue Output</b>	1.Check if the display is jittery	<p><b>A.</b>If the input signal was jittery continuously, please set higher value in [ RUG](A1-12 or A2-12) or [nURUG](A1-13 or A2-13)</p> <p><b>B.</b>If the input signal is jittery with a uncertain period that caused by the inductive load actions, please set higher value in [dF iLr](A1-14 or A2-14)</p> <p><b>C.</b>Please does not lay the wires of input together with high-voltage lines or power lines. As a general rule, wire connecting with the meter has to be in a separate system, use an independent metal conduit, or use shielded cable.</p>
	2.Check if the display is stable	Please do not lay the wires of output together with high-voltage lines or power lines. As a general rule, wire connecting with the meter has to be in a separate system, use an independent metal conduit, or use shielded cable.

#### RS485 Communication Issue:

PROBLEM	CHECKING LIST	REMEDY
<b>Can not link</b>	Check if the square orange LED of RS485 doesn't bright.	<p><b>A.</b>Please check the [PdrE5](E-1) \ [ bRUd](E-2) and [Pr iEY](E-3) in [r 5485 Gr oUP] that both have to match the Host.</p> <p><b>B.</b>Please check the wiring A(+) and B(-) are correct or not?</p> <p><b>C.</b>If user uses a converter (RS485/RS232 or RS485/USB..), please check the converter of setting and wiring is correct or not?</p> <p><b>D.</b>Please check the protocol of host is Modbus RTU Mode</p>
<b>Reply wrong data from the meter</b>	1.Check if the square orange LED of RS485 dose bright, but no reply.	<p><b>A.</b>Please confirms the CHECH SUM program is correct.</p> <p><b>B.</b>Please check the interval of each command has to over 3.5byte.</p>
	2. Check if the square orange LED of RS485 dose bright, but reply Error.	<p><b>A.</b>Please checks the address table of RS485 to assume whether did the address right or not?</p> <p><b>B.</b>Please checks the start address and data format are correct.</p> <p><b>C.</b> Please do not lay the wires of RS485 together with high-voltage lines or power lines. As a general rule, wire the meter in a separate system, use an independent metal conduit, or use shielded cable.</p>

## ■ RS485(Modbus RTU Mode)

### ■ Modbus RTU Mode Protocol

#### 1. Function 03H (Read Holding Registers)

Request Data Frame ; EX: Read the data of display value(0000H starts from 1 Word)

SLAVE Address	FUNCTION	Starting Address Hi	Starting Address Lo	No. of Word Hi	No. of Word Lo	CRC Lo	CRC Hi
01H	03H	00H	00H	00H	01H	84H	0AH

Response Data Frame ; EX: The response value is "0"

SLAVE Address	FUNCTION	Byte count	Data Hi	Data Lo	CRC Lo	CRC Hi
01H	03H	02H	00H	00H	B8H	44H

Request Data Frame ; EX: Continue to request the data of 10 points

SLAVE Address	FUNCTION	Starting Address Hi	Starting Address Lo	No. of Word Hi	No. of Word Lo	CRC Lo	CRC Hi
01H	03H	00H	00H	00H	0AH	C5H	CDH

Response Data Frame

SLAVE Address	FUNCTION	Byte count	Data(1) Hi	Data(1) Lo	...	...	Data(10) Hi	Data(10) Lo	CRC Lo	CRC Hi
01H	03H	14H	00H	00H	...	...	01H	00H	--	--

#### 2. Function 06H (Preset Single Register)

Request Data Frame

SLAVE Address	FUNCTION Code	Starting Address Hi	Starting Address Lo	Preset DATA Hi	Preset DATA Lo	CRC Lo	CRC Hi
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01H	06H	00H	05H	00H	01H	58H	0BH
-----	-----	-----	-----	-----	-----	-----	-----

Response Data Frame

SLAVE Address	FUNCTION Code	Starting Address Hi	Starting Address Lo	Preset DATA Hi	Preset DATA Lo	CRC Lo	CRC Hi
01H	06H	00H	05H	00H	01H	58H	0BH

**ADDRESS TABLE \*\*Address number are Hexadecimal**

■ User Level

Name	Address	Range	Explain	Initial	Write/Read	Note
PV.12	0000h	-19999~99999	Present Value with mathwmatic function (High word)		R	
PV.12	0001h	-19999~99999	Present Value with mathwmatic function (Low word)		R	
rYISP	0002h	-19999~99999	Relay1 Set Point (High word)	10000	R/W	
rYISP	0003h	-19999~99999	Relay1 Set Point (Low word)	10000	R/W	
rYISP	003Ah	-19999~99999	Relay1 Set Point (High word)	10000	R/W	★
rYISP	003Bh	-19999~99999	Relay1 Set Point (Low word)	10000	R/W	★
rY2SP	003Ch	-19999~99999	Relay1 Set Point (High word)	10000	R/W	★
rY2SP	003Dh	-19999~99999	Relay1 Set Point (Low word)	10000	R/W	★
n in 12	0004h	-19999~99999	The Minimum of PV.12 (High word)	0	R	
n in 12	0005h	-19999~99999	The Minimum of PV.12 (Low word)	0	R	
nA 12	0006h	-19999~99999	The Maximum of PV.12 (High word)	0	R	
nA 12	0007h	-19999~99999	The Maximum of PV.12 (Low word)	0	R	
RS485	0008h	-19999~99999	PV .12 be written in by RS485 (High word)		R/W	
RS485	0009h	-19999~99999	PV .12 be written in by RS485 (Low word)		R/W	
RoLS	000Ah	-19999~99999	Analogue Output Low Scale (High word)	0	R/W	
RoLS	000Bh	-19999~99999	Analogue Output Low Scale (Low word)	0	R/W	
RoHS	000Ch	-19999~99999	Analogue Output High Scale (High word)	19999	R/W	
RoHS	000Dh	-19999~99999	Analogue Output High Scale (Low word)	19999	R/W	
PV1	000Eh	-19999~29999	Present Value of Input 1		R	
PV2	000Fh	-19999~29999	Present Value of Input 2		R	
Pu1dP	0010h	0~4	Decimal Point of PV1 0: 00000 1: 0000.0 2: 000.00 3: 00.000 4: 0.0000	0	R/W	
Pu2dP	0011h	0~4	Decimal Point of PV2 0: 00000 1: 0000.0 2: 000.00 3: 00.000 4: 0.0000	0	R/W	
PV12.DP	0012h	0~4	Decimal Point of PV12 0: 00000 1: 0000.0 2: 000.00 3: 00.000 4: 0.0000		R	
RELAY STATUS	0013h	0~1	RELAY STATUS bit0:relay1; 0=Relay off 1=Relay on		R/W	
RELAY STATUS	003Dh	0~1	RELAY STATUS bit0~bit1:relay1~relay2; 0=Relay off 1=Relay on		R/W	★
SYSTEM STATUS	0014h		SYSTEM STATUS bit0=1 EEP fail; bit1=1 Input calibration fail; bit2=1 Input calibration NG; bit3=1 Analogue Output calibration fail; bit4=1 Analogue Output calibration NG		R	
n r St	0015h	0~1	Reset Maximum & Minimum Value 0:No 1:Yes	0	R/W	

★- 2 Relay only

## ■ Programming Level

【Input Group】						
Name	Address	Range	Explain	Initial	Write/Read	Note
R1Lo	0016h	0.00~100.00%	Input 1 Low	0.00%	R/W	
R1Hi	0017h	0.00~100.00%	Input 1 High	100.0%	R/W	
R2Lo	0018h	0.00~100.00%	Input 2 Low	0.00%	R/W	
R2Hi	0019h	0.00~100.00%	Input 2 High	100.0%	R/W	
LoSC1	001Ah	-19999~29999	Low Scale of Input 1	0	R/W	
HiSC1	001Bh	-19999~29999	High Scale of Input 1	19999	R/W	
LoSC2	001Ch	-19999~29999	Low Scale of Input 2	0	R/W	
HiSC2	001Dh	-19999~29999	High Scale of Input 2	19999	R/W	
PV1Po	001Eh	-19999~29999	PV1 ZERO	0	R/W	
PV1Sn	001Fh	-19999~29999	PV1 SPAN	0	R/W	
PSCL1	0020h	0~3	The clear of PV1_ZERO and PV1_SPAN 0: None 1: PV1_ZERO 2: PV1_SPAN 3: Both	0	R/W	
PV2Po	0021h	-19999~29999	PV2 ZERO	0	R/W	
PV2Sn	0022h	-19999~29999	PV2 SPAN	0	R/W	
PSCL2	0023h	0~3	The clear of PV2_ZERO and PV2_SPAN 0: None 1: PV2_ZERO 2: PV2_SPAN 3: Both	0	R/W	
dSPLY	0024h	0~3	Display Mode 0: PV.12 1: Minimum Hold 2: Maximum Hold 3: RS485	0	R/W	
LoCt1	0025h	-19999~19999	Low Cut of PV1	0	R/W	
LoCt2	0026h	-19999~19999	Low Cut of PV2	0	R/W	
Avg	0027h	1~99	Average	5	R/W	
dFilt	0028h	0~99	Digital Filter	0	R/W	
PCodE	0029h	0000~9999	Pass Code	1000	R/W	
FLoCk	002Ah	0~3	Function Lock 0: none 1: User Level 2: Engineer Level 3: All	0	R/W	
Pu12=	002Bh	0~9	Mathematic function for display 0: PV1 1: PV2 2: PV1+PV2 3: PV1-PV2 4: PV2-PV1 5: PV1×PV2 6: PV1÷PV2 7: PV2÷PV1 8: Tracking Low 9: Tracking High	0	R/W	
【Relay Group】						
Name	Address	Range	Explain	Initial	Write/Read	Note
rYsb	002Ch	0000~9999	Start Band of Relay	0	R/W	
rYsd	002Dh	0000~5999 (0.1second)	Start Delay Time of Relay	0	R/W	
rY1nd	002Eh	0~5	Relay1 Energized Mode 0: OFF(no use); 1: Lo(Low Energized); 2: Hi(High Energized) 3: Lo Hold(Low Energized Hold) 4: High Hold(High Energized Hold) 5: DO(Digital Output);	2	R/W	
rY1HY	002Fh	0000~5000	Hysteresis of Relay1	0	R/W	
rY1rd	0030h	0000~5999 (0.1second)	Energized Delay Time of Relay1	0	R/W	
rY1fd	0031h	0000~5999 (0.1second)	De-Energized Delay Time of Relay1	0	R/W	

Name	Address	Range	Explain	Initial	Write/Read	Note
rY1nD	003Eh	0~5	Relay1 Energized Mode 0: oFF(no use); 1: Lo(Low Energized); 2: Hi(High Energized) 3: Lo Hold(Low Energized Hold) 4: High Hold(High Energized Hold) 5: DO(Digital Output);	2	R/W	★
rY1HY	003Fh	0000~5000	Hysteresis of Relay1	0	R/W	★
rY1rD	0040h	0000~5999 (0.1second)	Energized Delay Time of Relay1	0	R/W	★
rY1Fd	0041h	0000~5999 (0.1second)	De-Energized Delay Time of Relay1	0	R/W	★
rY2nD	0042h	0~5	Relay2 Energized Mode 0: oFF(no use); 1: Lo(Low Energized) 2: Hi(High Energized) 3: Lo Hold(Low Energized Hold) 4: High Hold(High Energized Hold) 5: DO(Digital Output);	1	R/W	★
rY2HY	0043h	0000~5000	Hysteresis of Relay2	0	R/W	★
rY2rD	0044h	0000~5999 (0.1second)	Energized Delay Time of Relay2	0	R/W	★
rY2Fd	0045h	0000~5999 (0.1second)	De-Energized Delay Time of Relay2	0	R/W	★
rYrSt	0032h		Reset for Relay Energized Hold 0: No 1: Yes	0	R/W	

★- 2 Relay only

#### 【AO Group】

Name	Address	Range	Explain	Initial	Write/Read	Note
RoLYP	0033h	0~5	Analog Output Type 0: 0~10V 1: 0~5V 2: 1~5V 3: 0~20mA 4: 4~20mA 5: 0~10mA	4	R/W	
PSCLR	0034h	0~3	The clear of AO_ZERO and AO_SPAN 0: None 1: AO_ZERO 2: AO_SPAN 3: Both	0	R/W	
RoLnE	0035h	00.00%~110.00%	Analogue Output High Limit	110.00%	R/W	

#### 【RS485 Group】

Range	Range	Range	Range	Range	Range	
AdRES	0036h	1~255	RS485 address	1	R/W	
baUD	0037h	0~5	RS485 baud rate 0:1200 1:2400 2:4800 3:9600 4:19200 5:38400	3	R/W	
Pr iEY	0038h	0~3	RS485 parity 0: n-8-1 1: n-8-2, 2: odd, 3: even,	1	R/W	

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