ST-LC

MATH CONDITIONER WITH LED DISPLAY

OPERATION MANUAL

ST-LC MATH CONDITIONER WITH LED DISPLAY OPERAIION 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: ± 0.04% or ± 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
A	b	C	d	E	F	G	H	ı	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	u	W	X	y	Z

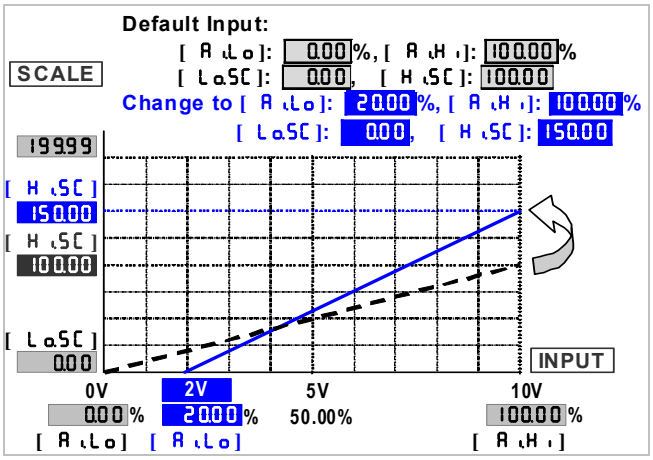
1	2	3	4	5	6	7	8	9	0	/	.
1	2	3	4	5	6	7	8	9	0	/	.

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 [A .Lo] & [AoH ı]

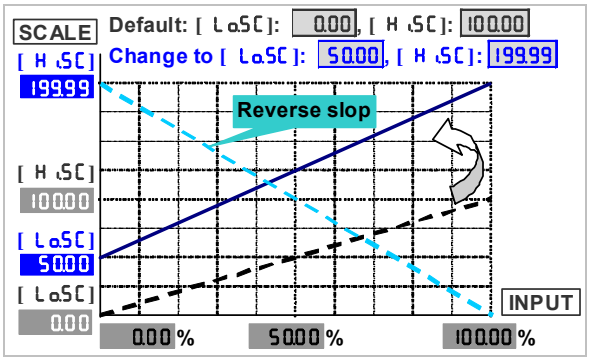
The meters had been set the input range as per order code (ex. 0~10V or 4(0)~20mA) in factory. If the meters requested to convert into difference inputs ranges, the meters can be switched function [A .Lo] and [A .H ı] in [inPUt GroUP]to meet the input signal. For example: The meter is 0~10Vdc input, and the signal from sensor is 2~10Vdc. Please enter into the [inPUt GroUP] to set [A .Lo] (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 .SC] and [LoSC]

Programming range: -19999~+29999counts

Setting the [LoSC](Low scale) and [H .SC] (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 [A .Lo] & [A .H ı] have been changed, the [LoSC] & [H .SC] will be related to the new setting of [A .Lo] & [A .H ı].

■ Display Functions

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

►If operation result surpasses 99999，the display will be oUFL (overflow)

►**When** ×(multiply operation)，decimal point display automatically for the biggest resolution，decided by product result of H.SC.1 (High Scale of input 1) and H.SC.2 (High Scale of input 2)

For example: H.SC.1 is 100.00 ; H.SC.2 is 200.00 multiplication result to display 20000，and does ont have decimal point or

H.SC.1 is 10.000 ; H.SC.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.SC.1 (High Scale of input 1) and H.SC.2 (High Scale of input 2)

For example: H.SC.1 is 800.00 ; H.SC.2 1s 20.000 ; division result to display 40.00

■ **Tracking high or low value:**

When [Pu.12] is setted trHi or trLo，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 [rSt] in **[user level]**. And it'll record new maximum and minimum value immediately after reset.

■ **Display function [dSPLY] for display screen**

The [dSPLY] function in [inPUt GroUP] can be set to show present value Pu, Maximum Hold MAXHd or Minimum Hold MinHd or Remote display by RS485 command rS485. Please refer to following for detail.

● **Present value Pu**

Display screen will show the value that is relative to input and [LoSC](Low scale) and [H.SC] (High scale) setting.

● **Remote display rS485 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 [dSPLY] function set to be rS485, 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.

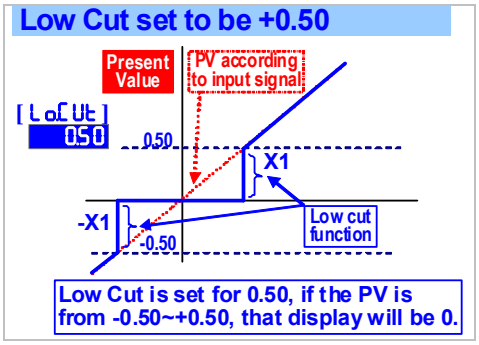
■ **Low Cut [LoCUt]**

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

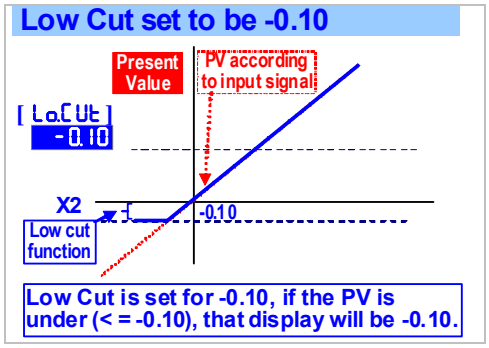
EX: Low Cut is set for 0.50. If the display is from -0.50~+0.50, that will be 0.



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.



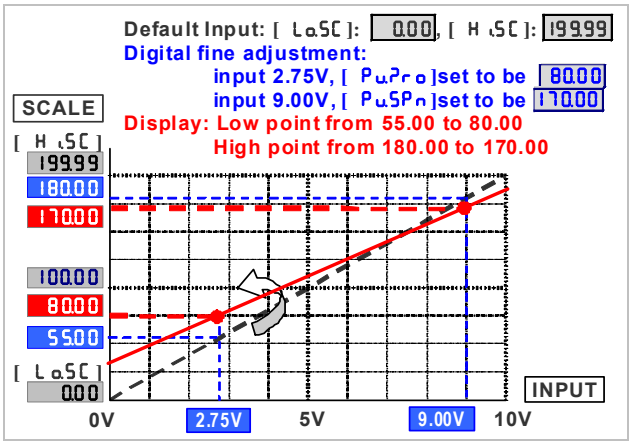
■ **Digital Fine Adjustment [Pu.Pro] & [Pu.SPn]**

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 **[Pu.Pro]** & **[Pu.SPn]** are not only in zero & span of PV, but also randomly lower point in function **[Pu.Pro]** & randomly higher point in function **[Pu.SPn]**. The meter will be auto-linearization for full scale.

The adjustment can be cleared in function **[P.SCLr]**.



*Please make sure that the **[Pu.Pro]** point must be less than **[Pu.SPn]** 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 [AvG]

Settable range: 1~99 times;

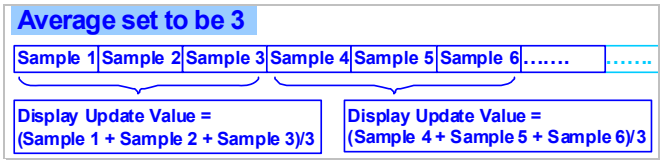
Jittery Display caused by the noise or unstable signal. User can set the times to average the readings, and to get smoothly display.

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 [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.



■ Moving Average update [mAvG]

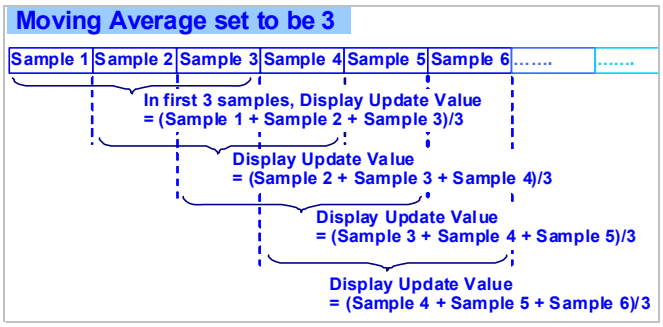
Settable range: 0(no function)/1~10 times;

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 1st updated display value will be slower.

The meter's sampling is 15cycle/sec. If the [mAvG](Moving Average) set to be 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.

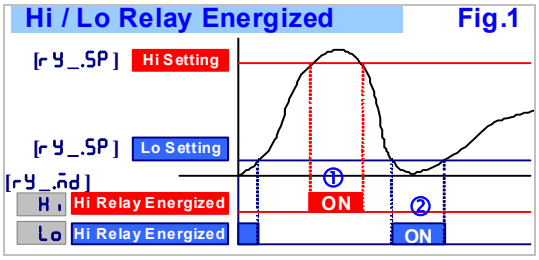
If the values of samples are over digital filter band(fixed in firmware and about 5% of stable reading) 3 times (Digital Filter set to be 3) continuously, the meter will admit the samples and update the new reading. Otherwise, it will be as treat as a noise and skip the samples.

■ Relay Functions

ST-LC series offer the 2 relay outputs with more flexible and multi-functions. They can be programmable individually in [rELAY GroUP] ◦ Please refer to the description as following;

■ Relay energized mode [ry_md] Hi / Lo / Hi(Lo) latch / DO

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

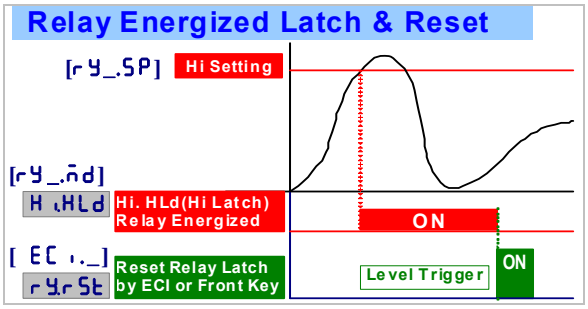


- **Hi alarm & latch / Lo alarm & latch (Hi.HLd / Lo.HLd)**

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]** rYrSt 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 [ry_md] had been set do, the relay will be energized by RS485 command directly, but no longer to compare with set-point.

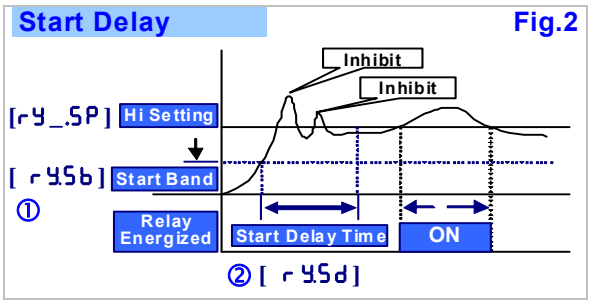
■ Start delay band [ry5b]and Start delay time [ry5d]

The functions have Been designed for,

1. To avoid starting current of inductive motor (6 times of rated current) with alarm.
2. If the ry_md relay energized mode had been set to be Lo (Lo) or Lo.HLd (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 [rYSb] (Fig.2-①):**
  Settable range from 0~9999 Digits
- **Start delay time [rYSd] (Fig.2-②):**
  Settable range from 0.0(second)~9(minutes)59.9(seconds);



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

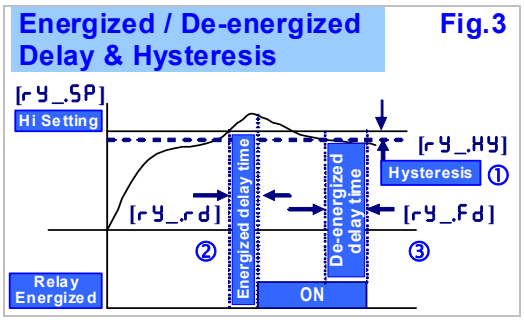
As the display value is swing near by the set point to cause the relay on and off frequently. The function is to avoid the relay on and off frequently such as compressor…….etc.,

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

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



■ Analogue Output Functions

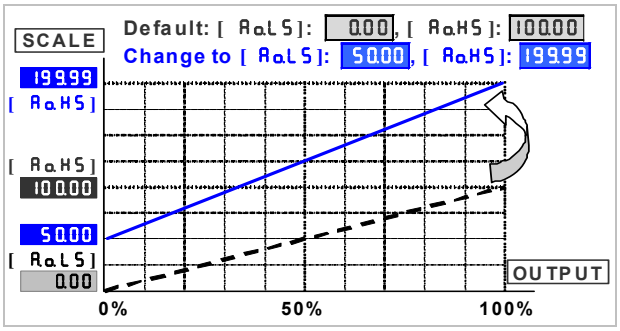
Please specify the output type either 0~10V or 4(0)~20mA in ordering code. The output low and high can be programmable which it's related with various display values. Reverse slope output is decided by reversing point positions.

■ **Output range selection ([AotYP])**

- **Voltage output specified**
  Programming : u0-10(0~10V) / u0-5(0~5V) / u1-5(1~5V)
- **Currnet output specified**
  Programming : A4-20(4~20mA) / A0-20(0~20mA) / A0-10(0~10mA

■ **Low Output corresponds to Low display value [AoLS]**
Settable range: -19999~+29999;
Setting the Low Display value versus Low output range (as like as 4mA in A4-20).

■ **High Output corresponds to High display value [AoHS]**
Settable range: -19999~+29999;
Setting the High Display value versus High output range (as like as 20mA in A4-20)



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

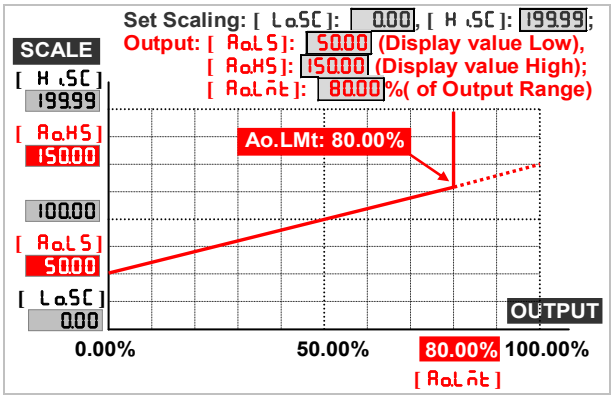
■ **Fine Zero & Span Adjustment for Analogue Output**

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 [AoPro]:**
  Settable range: -38011~27524;
- **Fine Span Adjustment for Analogue Output [AoSPn]:**
  Settable range: -38011~27524;

■ **High Limited for Analog Output [AoLmt]**
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.

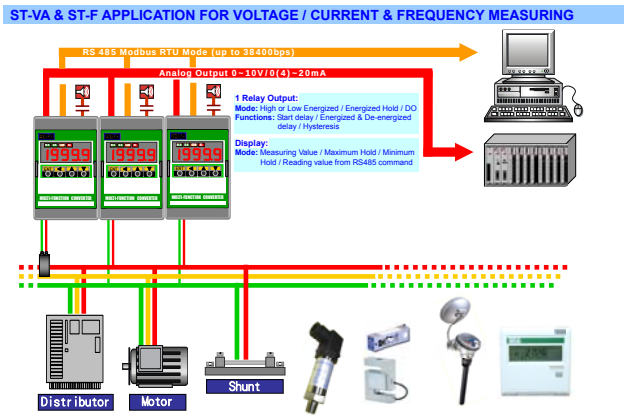


■ RS485 Communication

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 tY]:** Programmable Even / Odd / None

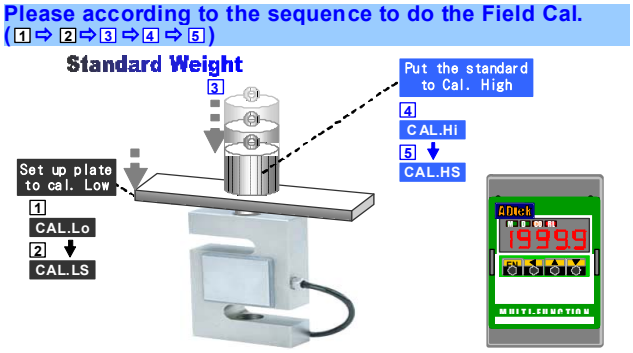
Device Number [AdrES]: Settable 1~255



■ Field Calibration

■ In pass 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.



■ ORDERING INFORMATION

ST-LC- [Input Signal 1] [Input Signal 2] – [Relay Output] – [Analogue Output] – [RS 485 Port] – [Aux. Power]

OPTION 1 / OPTION 2 / OPTION 3

CODE	VOLT INPUT
VC	0 ~ 100 mV
V1	0 ~ 10 V
A1	0(4) ~ 20 mA
VO	Specify V input
AO	Specify A input

CODE	CURRENT INPUT
S1	0 ~ 10 mV
S4	0 ~ 20 mV
S6	0 ~ 40 mV
SO	Specify mV input

CODE	RELAY O/P
N	None
R1	1 Relay
R2	2 Relay

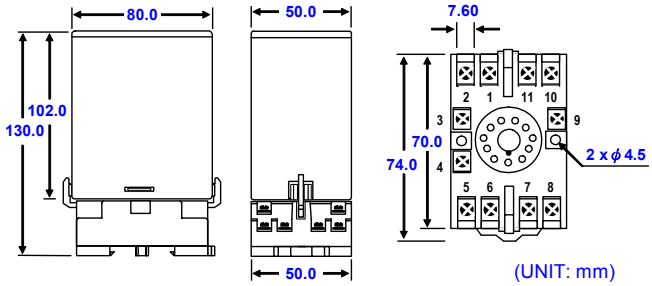
CODE	ANALOG O/P
N	None
V	0(1) ~ 5 V 0 ~ 10 V
I	0 ~ 10 mA 0(4)~20 mA

CODE	RS485 PORT
N	None
8	RS 485

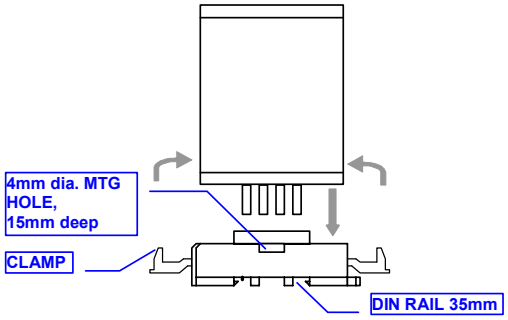
CODE	AUX. POWER
A1	AC 115 V
A2	AC 230 V
OPTION 4	
ADH	AC/DC 85~264 V
ADL	DC 20~56V

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

■ Dimensions



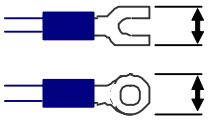
■ Installation



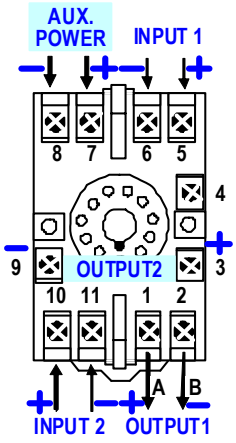
■ Wiring Diagram

Connector

10A/300Vac,
M3.0, 1.3~3.5mm² (22~12AWG);
Max torque: 13Kg-cm



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

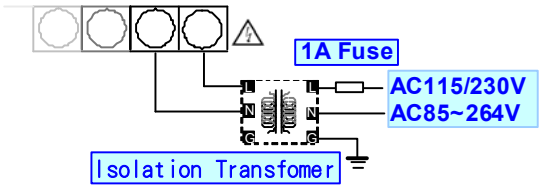


Remark: ST series has been designed in multi-output with limited terminals. Please check the output functions and specify terminals as label on product before wiring.

	OUTPUT 1 TERMINAL 1+ & 2-	OUTPUT 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	

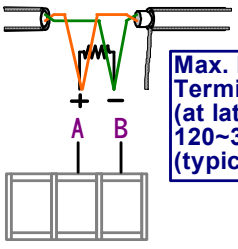
Power Supply

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

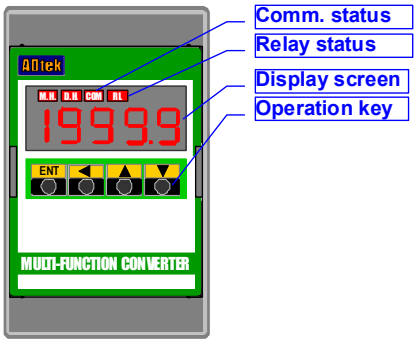
RS485 Communication Port



Max. Distance: 1200M
Terminate Resistor (at latest unit): 120~300ohm/0.25W (typical: 150ohm)

OPERATIONS

FRONT PANEL



■ **Numeric Screen:**

● 88888: 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 Communiaction: 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:**

HH HH Energized Hi Hi Energized

Lo Lo Energized LL LL Energized

Hi.H Hi Energized & Latch Lo.H Lo Energized & Latch

DO 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 Massage

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

DISPLAY	DESCRIPTION:	REMARK
ouFL	Display is positive-overflow (Signal is over display range)	Please check the input signal
-ouFL	Display is negative-overflow (Signal is under display range)	Please check the input signal
ouFL	ADC is positive-overflow (Signal is higher than input 120%)	Please check the input signal
-ouFL	ADC is negative-overflow (Signal is lower than input -120%)	Please check the input signal
EEP ⇄ FA iL	EEPROM occurs error	Please send back to manufactory for repaired
A iCnG ⇄ Pu	Didn’t execute the calibrate of Input Signal	Please process Calibrating Input Signal
A iC ⇄ FA iL	Input signal calibrated error	Please check Calibrating Input Signal
AoCnG ⇄ Pu	Didn’t execute the calibrate of output Signal	Please process Calibrating Output Signal
AoC ⇄ FA iL	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

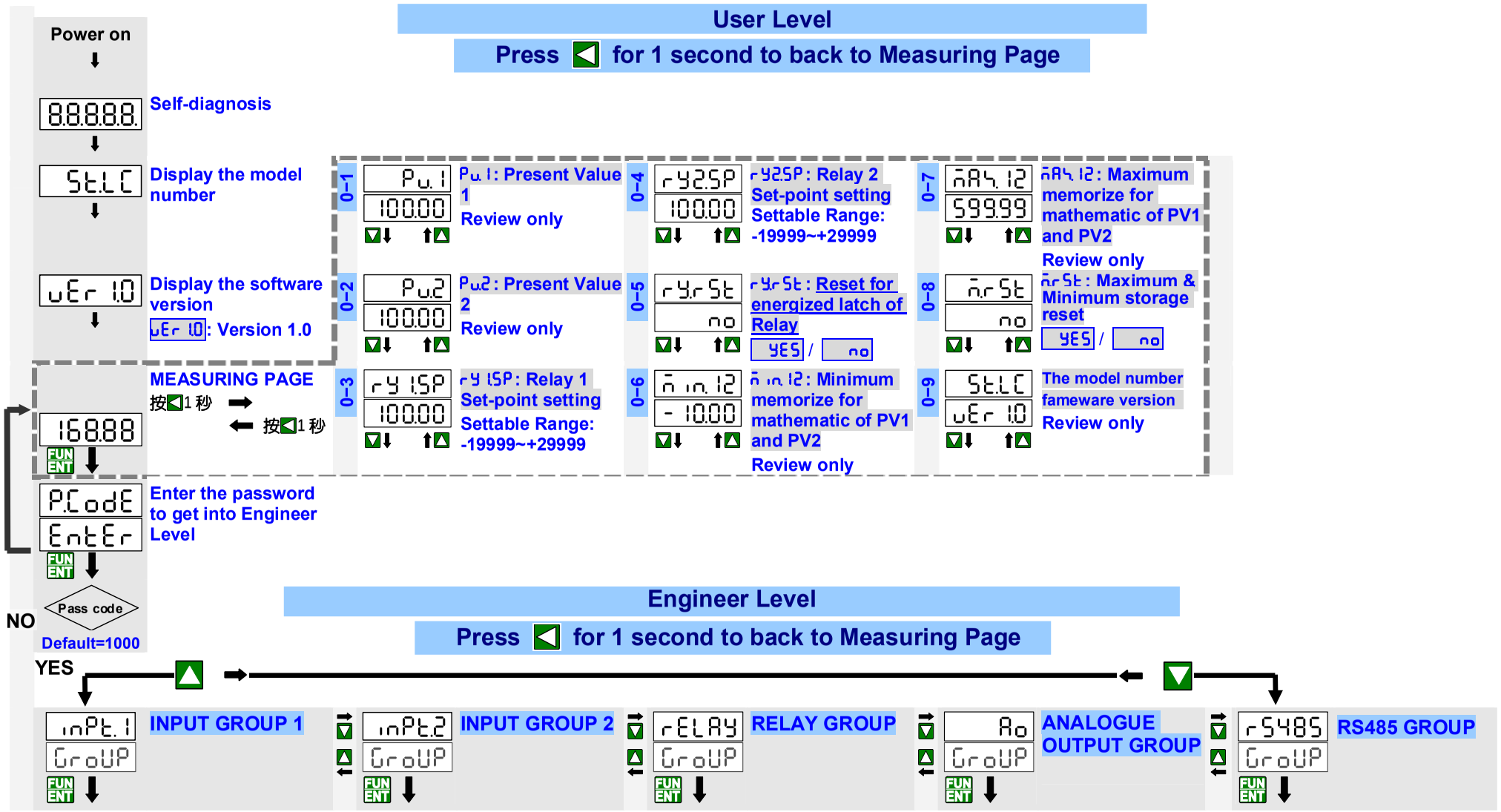
■ Operating Key: 4 keys for Enter(Function) / Shift(Escape) / Up key / Down key

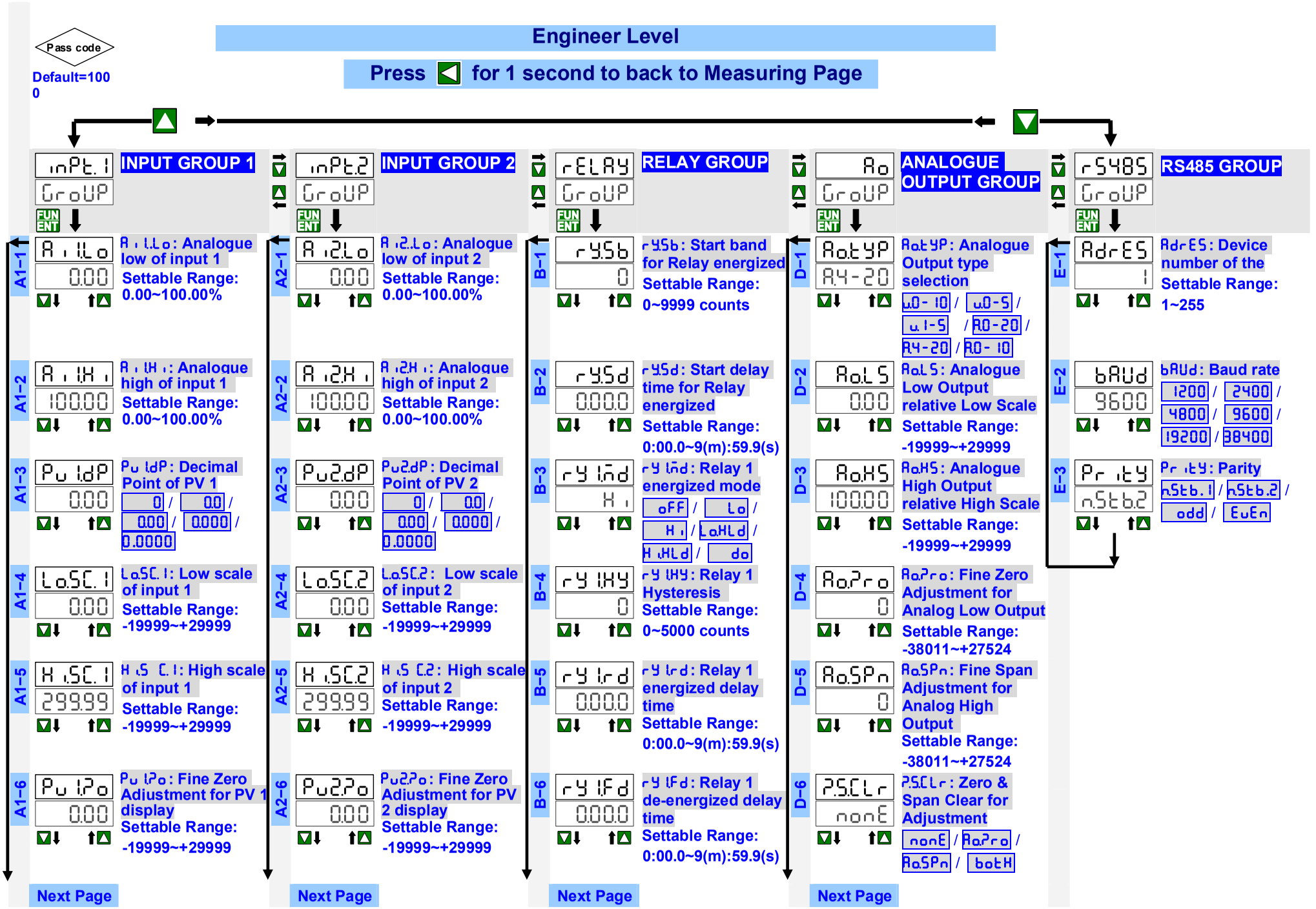
■ The meter has designed operation similar as PC's ⇦ ⇨ and Enter. In any page, press key means "enter" or "confirm setting", and press key means "escape(Esc)" or "shift".

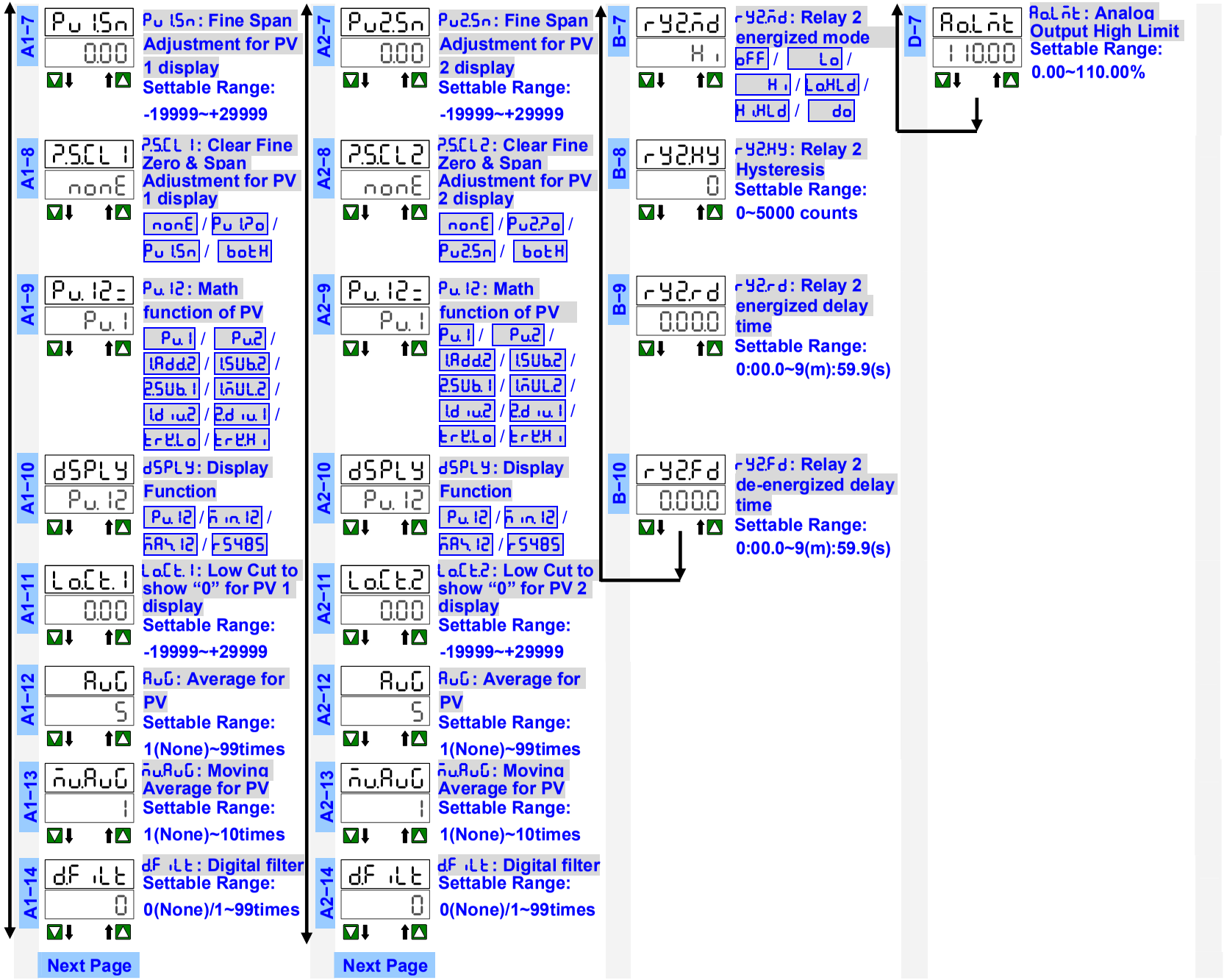
■ In Programming Level, the screen will return to Measuring Page after do not press any key over 2 minutes, or press for 1 second.

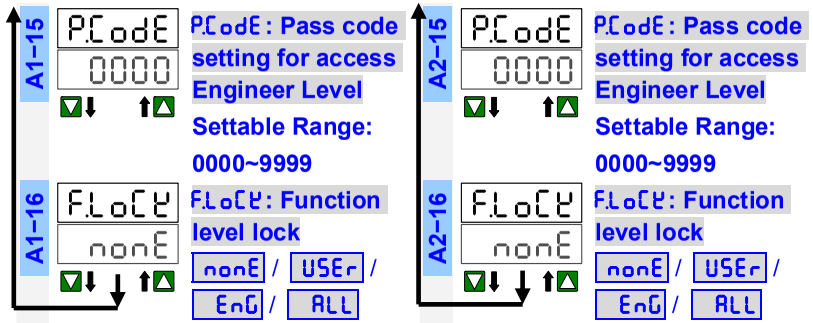
	Function Index	Setting Status
(= FUN ENT) **Enter/Fun key**	(1) In any page, press to access the level or function index (2) From the function index to access setting status	(3) Setting Confirmed, save to EEProm and go to next function index
(= ◁) **Shift key**	(1) In measuring page, press for 1 second 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.
(= △) **Up key**	(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
(= ▽) **Down key**	(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.

OPERATING DIAGRAM

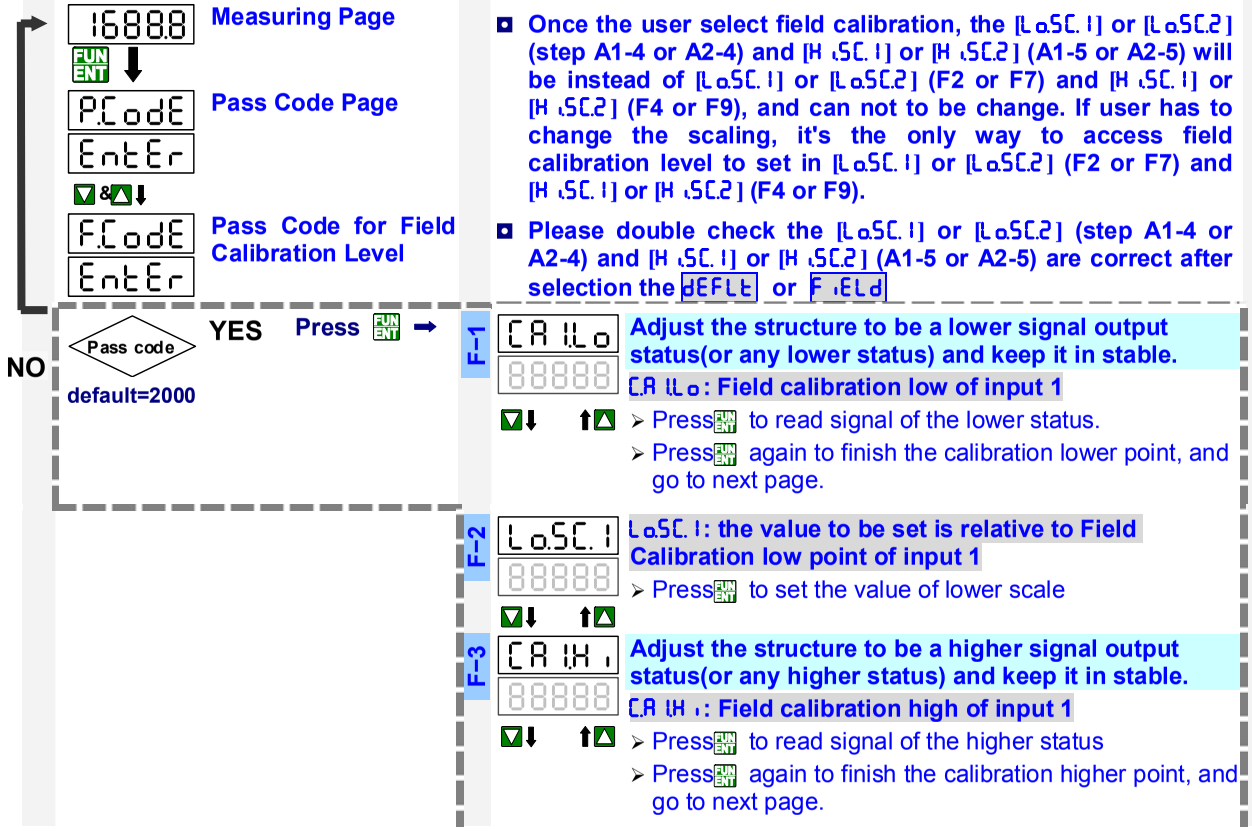



Pass code
Default=100
0
Engineer Level
Press for 1 second to back to Measuring Page
INPUT GROUP 1
INPUT GROUP 2
RELAY GROUP
ANALOGUE OUTPUT GROUP
RS485 GROUP
A1-1 A1.1Lo: Analogue low of input 1 Settable Range: 0.00~100.00%
A1-2 A1.1H1: Analogue high of input 1 Settable Range: 0.00~100.00%
A1-3 Pu1dP: Decimal Point of PV 1 0 / 0.0 / 0.00 / 0.000 / 0.0000
A1-4 LoSC.1: Low scale of input 1 Settable Range: -19999~+29999
A1-5 H1SC.1: High scale of input 1 Settable Range: -19999~+29999
A1-6 Pu1Po: Fine Zero Adiustment for PV 1 display Settable Range: -19999~+29999
A2-1 A2.2Lo: Analogue low of input 2 Settable Range: 0.00~100.00%
A2-2 A2.2H1: Analogue high of input 2 Settable Range: 0.00~100.00%
A2-3 Pu2dP: Decimal Point of PV 2 0 / 0.0 / 0.00 / 0.000 / 0.0000
A2-4 LoSC.2: Low scale of input 2 Settable Range: -19999~+29999
A2-5 H1SC.2: High scale of input 2 Settable Range: -19999~+29999
A2-6 Pu2Po: Fine Zero Adiustment for PV 2 display Settable Range: -19999~+29999
B-1 rY5b: Start band for Relay energized Settable Range: 0~9999 counts
B-2 rY5d: Start delay time for Relay energized Settable Range: 0:00.0~9(m):59.9(s)
B-3 rY1Ad: Relay 1 energized mode oFF / Lo / H1 / LoHLd / HiHLd / do
B-4 rY1HY: Relay 1 Hysteresis Settable Range: 0~5000 counts
B-5 rY1rd: Relay 1 energized delay time Settable Range: 0:00.0~9(m):59.9(s)
B-6 rY1Fd: Relay 1 de-energized delay time Settable Range: 0:00.0~9(m):59.9(s)
D-1 AotYP: Analogue Output type selection 0-10 / 0-5 / 1-5 / 20-0 / 4-20 / 10-0
D-2 AoLS: Analogue Low Output relative Low Scale Settable Range: -19999~+29999
D-3 AoHS: Analogue High Output relative High Scale Settable Range: -19999~+29999
D-4 Ao2ro: Fine Zero Adjustment for Analog Low Output Settable Range: -38011~+27524
D-5 AoSPn: Fine Span Adjustment for Analog High Output Settable Range: -38011~+27524
D-6 2SCLr: Zero & Span Clear for Adjustment nonE / Ao2ro / AoSPn / both
E-1 AdrES: Device number of the Settable Range: 1~255
E-2 bAUd: Baud rate 1200 / 2400 / 4800 / 9600 / 19200 / 38400
E-3 PrtY: Parity nStb.1 / nStb.2 / odd / EuEn
Next Page
Next Page
Next Page
Next Page


A1-7
Pu.1Sn
0.00
Pu.1Sn: Fine Span Adjustment for PV 1 display
Settable Range:
-19999~+29999
A1-8
P.SCL.1
nonE
P.SCL.1: Clear Fine Zero & Span Adjustment for PV 1 display
nonE / Pu.1Po / Pu.1Sn / botH
A1-9
Pu.12=
Pu.1
Pu.12: Math function of PV
Pu.1 / Pu.2 / 1Add2 / 1SUb2 / 2SUb.1 / 1dIV.2 / Id iu2 / 2.d iu.1 / trt.Lo / trt.HI
A1-10
dSPLY
Pu.12
dSPLY: Display Function
Pu.12 / Pu.1 / Pu.2 / 1Add2 / 1SUb2 / 2SUb.1 / 1dIV.2 / Id iu2 / 2.d iu.1 / trt.Lo / trt.HI / rAn.12 / rS485
A1-11
Lo.Ct.1
0.00
Lo.Ct.1: Low Cut to show "0" for PV 1 display
Settable Range:
-19999~+29999
A1-12
AuG
5
AuG: Average for PV
Settable Range:
1(None)~99times
A1-13
nu.AuG
1
nu.AuG: Moving Average for PV
Settable Range:
1(None)~10times
A1-14
dF iLt
0
dF iLt: Digital filter
Settable Range:
0(None)/1~99times
Next Page
A2-7
Pu2.Sn
0.00
Pu2.Sn: Fine Span Adjustment for PV 2 display
Settable Range:
-19999~+29999
A2-8
P.SCL2
nonE
P.SCL2: Clear Fine Zero & Span Adjustment for PV 2 display
nonE / Pu2.Po / Pu2.Sn / botH
A2-9
Pu.12=
Pu.1
Pu.12: Math function of PV
Pu.1 / Pu.2 / 1Add2 / 1SUb2 / 2SUb.1 / 1dIV.2 / Id iu2 / 2.d iu.1 / trt.Lo / trt.HI
A2-10
dSPLY
Pu.12
dSPLY: Display Function
Pu.12 / Pu.1 / Pu.2 / 1Add2 / 1SUb2 / 2SUb.1 / 1dIV.2 / Id iu2 / 2.d iu.1 / trt.Lo / trt.HI / rAn.12 / rS485
A2-11
Lo.Ct.2
0.00
Lo.Ct.2: Low Cut to show "0" for PV 2 display
Settable Range:
-19999~+29999
A2-12
AuG
5
AuG: Average for PV
Settable Range:
1(None)~99times
A2-13
nu.AuG
1
nu.AuG: Moving Average for PV
Settable Range:
1(None)~10times
A2-14
dF iLt
0
dF iLt: Digital filter
Settable Range:
0(None)/1~99times
Next Page
B-7
ry2.nd
H i
ry2.nd: Relay 2 energized mode
oFF / Lo / H i / LoHLd / H iHLd / do
B-8
ry2.HY
0
ry2.HY: Relay 2 Hysteresis
Settable Range:
0~5000 counts
B-9
ry2.rd
0.00.0
ry2.rd: Relay 2 energized delay time
Settable Range:
0:00.0~9(m):59.9(s)
B-10
ry2.Fd
0.00.0
ry2.Fd: Relay 2 de-energized delay time
Settable Range:
0:00.0~9(m):59.9(s)
D-7
Ao.Lnt
110.00
Ao.Lnt: Analog Output High Limit
Settable Range:
0.00~110.00%



Field Calibration Level



- 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 dEFLt or F.ELd

F-4

H.SC.1

88888

H.SC.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

F-5

C.SEL.1

dEFLd

➢ **C.SEL.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.ELd

dEFLd (default calibration) F.ELd (Field calibration)

F-6

CA2.Lo

88888

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

CA2.Lo: 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.

F-7

Lo.SC.2

88888

Lo.SC.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

F-8

CA2.H.

88888

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

CA2.H.: 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.

F-9

H.SC.2

88888

H.SC.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

F-10

C.SEL.2

dEFLd

➢ **C.SEL.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.ELd

dEFLd (default calibration) F.ELd (Field calibration)

Operating Steps

User Level

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
POWER ON			**Please check the specification and wiring diagrams firstly.**	
8.8.8.8.8.		**Self-diagnosis (LED All bright)**		
St.uA		**Model**		
u.Er2.0		**Firmware version**		
16888		**Measuring Page**		
		Press ◀ for 1 second return to Measuring Page		
0-1 Pu.1 / 0.0		**Pu.1 (PV1 disply): Present Value 1 ;**	**Review only**	
0-2 Pu.2 / 0.0		**Pu.2 (PV1 disply): Present Value 2 ;**	**Review only**	
0-3 rY1.SP / 1000.0	FUN/ENT → 1000.0 ▼▲◀ 2000.0 FUN/ENT Next Page	**rY1.SP (rY1.SP): Relay 1 Set-point setting**	**Settable Range: -19999~+99999** ◀Shift ▲Up ▼Down FUN/ENT Enter	
0-4 rY2.SP / 1000.0	FUN/ENT → 1000.0 ▼▲◀ 1000.0 FUN/ENT Next Page	**rY2.SP (rY2.SP): Relay 2 Set-point setting**	**Settable Range: -19999~+99999** ◀Shift ▲Up ▼Down FUN/ENT Enter	
0-5 rY.rSt / no	FUN/ENT → no ▼▲ YES FUN/ENT Next Page	**rY.rSt (rY.rSt): Reset for energized hold of Relay:** If the [rY_.nd](step B-3/7) set to be H.HLd or Lo.HLd, 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:** YES / no **YES (Yes):** reset the relay latching. **no (No):** abort to reset the relay latching. ▼Up ▲Down FUN/ENT 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 / -10.0		**n.in.12 (Min.12): Miniimum storage of PV1 and PV2 with math function(Pu.12)**	**Review only**	
0-7 nAX.12 / 5999.9		**nAX.12 (MAx.12): Maximum storage of PV1 and PV2 with math function(Pu.12)**	**Review only**	
Next Page				

0-8	n.rSt no YES		**n.rSt (M.rSt): reset the saved value of Maximum & Minimum;** The values of maximum and minimum can be reset in here. It will save newest maximum and minimum after reset.	**Programmable:** YES / 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
0-9	St.LC uEr 1.0		St.LC : Model uEr 1.0 (Ver 1.0): Firmware version	**Review only** **It will be announced in our website www.adtek.com.tw, when it had been versions updated.**

Programming Level

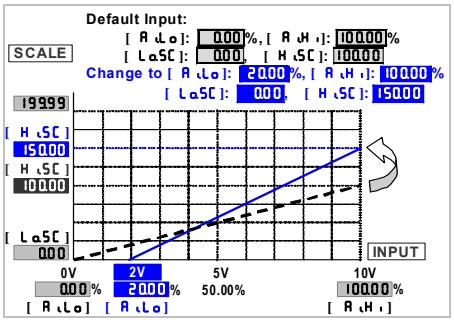
INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
1688.8		**MEASURING PAGE**		
EntEr P.CodE Default:1000	0000 1000	**Enter the pass code to access Programming Level**	**If user wants to change the pass code, please go to step A1-15 or A2-15 to set. Please remind the new pass code.**	

Pass Code → YES

Press ◀ for 1second to back Measuring Page

INPUT 1 GROUP	INPUT 2 GROUP	RELAY GROUP	ANALOGUE OUTPUT GROUP	RS485 GROUP
inPt.1 / GroUP	inPt.2 / GroUP	rELAY / GroUP	Ao / GroUP	rS485 / GroUP
PRESS TO ACCESS	PRESS TO ACCESS	PRESS TO ACCESS	PRESS TO ACCESS	PRESS TO ACCESS

Input 1 Group

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
inPt.1 GroUP		**INPUT 1 GROUP INDEX PAGE**		
		In following pages,press ◀ for 1 second to back INPUT 1 GROUP INDEX PAGE		
A1-1 Ai1.Lo 0.00	0000 0000	**Ai1.Lo (Ai1.Lo): Analogue input 1 low** Please refer to the explanations in **INPUT & SCALING** of **FUNCTION DEFINE**(page 1/35)	**Settable range: 0.00%~100.00%** ◀Shift Up Down Enter 	

Next Page

A1-2 | Ai1.Hi

Ai1.Hi (Ai1.Hi): Analogue input 1 high ;

Please refer to the explanations in **INPUT & SCALING** of **FUNCTION DEFINE**(page 1/35)

Settable range: 0.00%~100.00%

Shift Up Down Enter

A1-3 | Pv1.dP

Pv1.dP (Pv1.dP): Decimal Point of PV1 ;

Programmable:

0 / 0.0 / 0.00 / 0.000 / 0.0000

Up Down Enter

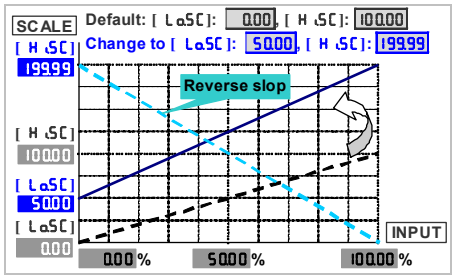
A1-4 | LoSC.1

LoSC.1 (Lo.SC.1): Low scale of input 1 ;

※ If the field calibration has be done and then the [C.SEL.1] selected to be FIELd, the [LoSC.1] will be replaced by [CALS], and it can not to be set.

Settable range: -19999~+29999

Shift Up Down Enter



A1-5 | HiSC.1

HiSC.1 (Hi.SC.1): High scale of input 1 ;

※ If the field calibration has be done and then the [C.SEL.1] selected to be FIELd, the [HiSC.1] will be replaced by [CALHS], and it can not to be set.

Settable range: -19999~+29999

Shift Up Down Enter

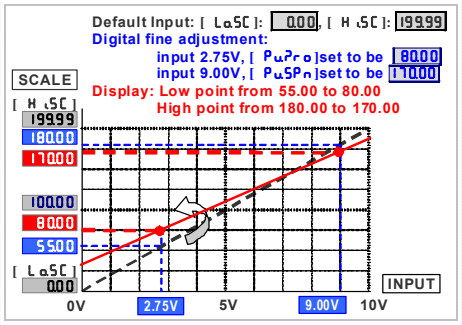
A1-6 | Pv1.Zo

Pv1.Zo (Pv1.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 [Pv1.Zo] & [Pv1.Sn] are not only in zero & span of PV, but also any lower point for [Pv1.Zo] & higher point for [Pv1.Sn]. The meter wills be linear for full scale.

Settable range: -19999~+29999

Shift Up Down Enter



A1-7 | Pv1.Sn

Pv1.Sn (Pv1.Sn): Fine Span Adjustment for PV1 display ;

It's same function as like as [Pv1.Zo]

Settable range: -19999~+29999

Shift Up Down Enter

A1-8 | Z.S.CL1

Z.S.CL1 (Z.S.CL1): Clear Fine Zero & Span Adjustment for PV1 display ;

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 & Span):** To clear the fine adjustment of Low and High for PV1.

Up Down Enter

Next Page

A1-9

Pu.12= / Pu.1 / trUH.1

Pu.12= (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
- 2SUb.1 **(2 Subtraction 1):** Show PV2-PV1
- 1MUL.2 **(1 Multiplication 2):** Show PV1×PV2
- 1d iu2 **(1 divide 2):** Show PV1÷PV2
- 2d iu.1 **(2 divide 1):** Show PV2÷PV1
- trtLo **(Tracking low):** Show tracking low.If PV1<PV2, show PV1; if PV2<PV1, show PV2.
- trUH.1 **(Tracking High):** Show tracking high.If PV1>PV2, show PV1; if PV2>PV1, show PV2.

Up Down Enter

A1-10

dSPLY / Pu.12 / r5485

dSPLY (dSPLY): Display Function ;

When the **[dSPLY]** function set to be r5485, 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
- r5485 **(RS485):** Remote displayed from RS485 command of master.

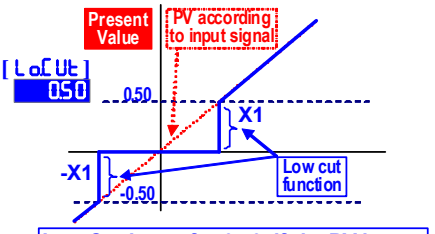
Up Down Enter

A1-11

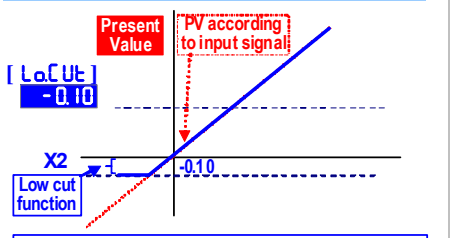
Lo.Ct.1 / 0000 / 0.00 / 0100.0

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

Low Cut set to be +0.50



Low Cut set to be -0.10



Settable range:
-19999~+19999 counts

Shift Up Down Enter

A1-12

AUG / 05 / 5 / 99

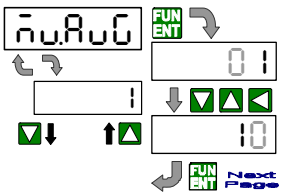
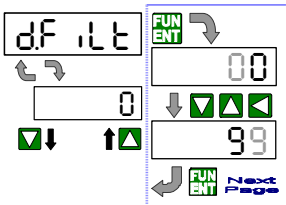
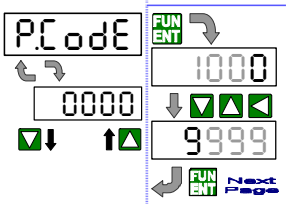
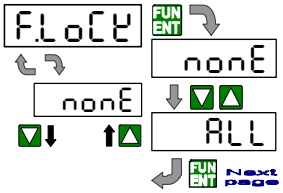
AUG (AvG): Average ;

The meter's sampling is 15cycle/sec
If the **[AUG]**(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.

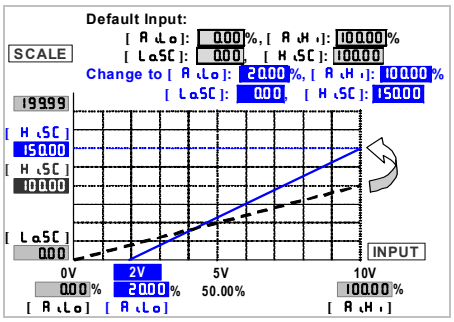
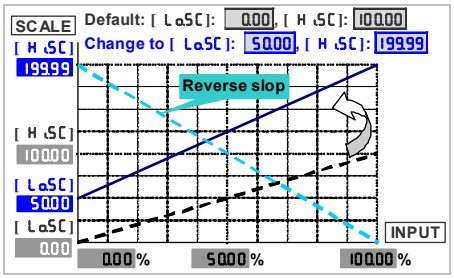
Settable range:
1(no function)~99 times

Shift Up Down Enter

Next Page

A1-13		**ñu.AuG (Mv.AvG): Moving Average) ;** The meter's sampling is 15cycle/sec. If the [ñu.AuG](Moving Average) set to be 1 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.	**Settable range:** **0(no function)/1~10 times;** **Shift Up Down Enter**
A1-14		**dF iLt (d.FiLt): Digital filter ;** 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.	**Settable range:** **0(no function)/1~99 times.** **Shift Up Down Enter**
A1-15		**PCodE (P.CodE): Pass Code ;** Please remind and write down the new pass code so that access to programming level.	**Settable range: 0000~9999** **Shift Up Down Enter**
A1-16		**FLoCK (F.LoCK): Function Lock) ;** There are 4 levels programmable for lock that the function is to avoid miss-setting.	**Programming:** nonE **(None):** no lock at all. User can access to user level for checking and setting. USEr **(User Level):** User level lock. User can access to user level for checking, but can not setting. EnG **(Programming Level):** Programming level lock. User can access to programming level for checking, but can not setting. ALL **(All Level):** All lock. User can access to all level for checking, but can not setting. **Up Down Enter**

Input 2 Group

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
inPt.2 GroUP		**INPUT 2 GROUP INDEX PAGE**		
		In following pages,press ◀ for 1 second to back INPUT 2 GROUP INDEX PAGE		
A2-1	A i2.Lo 0.00 0000.0 0000.0	**Ai2.Lo (Ai2.Lo): Analogue input 1 low** Please refer to the explanations in **INPUT & SCALING** of **FUNCTION DEFINE**(page 1/35)	**Settable range: 0.00%~100.00%** ◀Shift ▲Up ▼Down ENTEnter 	
A2-2	A i2.Hi 100.00 100.0 100.00	**Ai2.Hi (Ai2.Hi): Analogue input 1 high ;** Please refer to the explanations in **INPUT & SCALING** of **FUNCTION DEFINE**(page 1/35)	**Settable range: 0.00%~100.00%** ◀Shift ▲Up ▼Down ENTEnter	
A2-3	Pu2.dP 0 0 0.0000	**Pu2.dP (Pv2.dP): Decimal Point of PV1 ;**	**Programmable:** 0 / 0.0 / 0.00 / 0.000 / 0.0000 ▲Up ▼Down ENTEnter	
A2-4	Lo.SC.2 0.0 0000.0 0000.0	**Lo.SC.2 (Lo.SC.2): Low scale of input 2 ;** ※ If the field calibration has be done and then the [C.SEL.2] selected to be FiELd, the [Lo.SC.2] will be replaced by [CA2.LS], and it can not to be set.	**Settable range: -19999~+29999** ◀Shift ▲Up ▼Down ENTEnter 	
A2-5	Hi.SC.2 19999 1999.9 2000.0	**Hi.SC.2 (Hi.SC.2): High scale of input 2 ;** ※ If the field calibration has be done and then the [C.SEL.2] selected to be FiELd, the [Hi.SC.2] will be replaced by [CA2.HS], and it can not to be set.	**Settable range: -19999~+29999** ◀Shift ▲Up ▼Down ENTEnter	
Next Page				

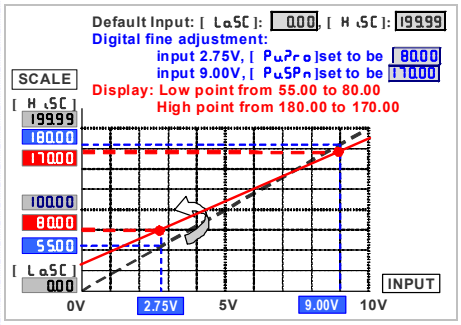
A2-6 Pu2.Zo

Pu2.Zo (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 [Pu2.Zo] & [Pu2.Sn] are not only in zero & span of PV, but also any lower point for [Pu2.Zo] & higher point for [Pu2.Sn]. The meter wills be linear for full scale.

Settable range: -19999~+29999

Shift **Up** **Down** **Enter**



A2-7 Pu2.Sn

Pu2.Sn (Pv2.Sn): Fine Span Adjustment for PV1 display ;

It's same function as like as [Pu2.Zo]

Settable range: -19999~+29999

Shift **Up** **Down** **Enter**

A2-8 P2.CL2

P2.CL2 (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.
- Pu2.Zo **(PV2.Zro):** To clear the fine adjustment Low for PV1.
- Pu2.Sn **(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** **Enter**

A2-9 Pu.12=

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

Programmable:

- Pu.1 **(PV1):** Show PV1
- Pu2 **(PV2):** Show PV2
- 1Add2 **(1 Add 2):** Show PV1+PV2
- 1Sub2 **(1 Subtraction 2):** Show PV1-PV2
- 2Sub.1 **(2 Subtraction 1):** Show PV2-PV1
- 1mUL.2 **(1 Multiplication 2):** Show PV1×PV2
- 1d iu2 **(1 divide 2):** Show PV1÷PV2
- 2d iu.1 **(2 divide 1):** Show PV2÷PV1
- trU.Lo **(Tracking low):** Show tracking low.If PV1<PV2, show PV1; if PV2<PV1, show PV2.
- trU.Hi **(Tracking High):** Show tracking high.If PV1>PV2, show PV1; if PV2>PV1, show PV2.

Up **Down** **Enter**

Next Page

A2-10

dSPLY

Pu.12

Pu.12

rS485

dSPLY (dSPLY): Display Function ;

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 & 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

Mn.12 **(Min.12):** Minimum Hold of PV.12

MAX.12 **(MAX.12):** Maximum Hold of PV.12

rS485 **(RS485):** Remote displayed from RS485 command of master.

Up **Down** **Enter**

A2-11

Lo.Ct.2

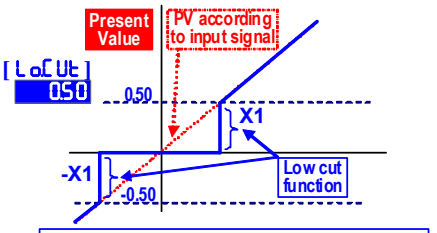
0000.0

0.00

0100.0

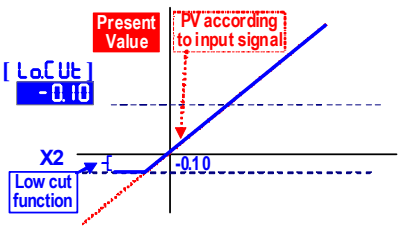
Lo.Ct.2 (Lo.Ct.2): Low Cut for PV2 display ;

Low Cut set to be +0.50



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

Low Cut set to be -0.10



Low Cut is set for -0.10, if the PV is under (< = -0.10), that display will be -0.10.

Settable range:

-19999~+19999 counts

Shift **Up** **Down** **Enter**

A2-12

AvG

05

5

99

AvG (AvG): Average ;

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.

Settable range:

1(no function)~99 times

Shift **Up** **Down** **Enter**

A2-13

mvAvG

01

1

10

mvAvG (Mv.AvG): Moving Average) ;

The meter's sampling is 15cycle/sec. If the [mvAvG](Moving Average) set to be 1 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.

Settable range:

0(no function)/1~10 times;

Shift **Up** **Down** **Enter**

A2-14

dF iLt

00

0

99

dF iLt (d.FiLt): Digital filter ;

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.

Settable range:

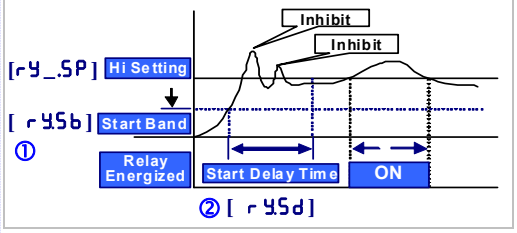
0(no function)/1~99 times.

Shift **Up** **Down** **Enter**

Next Page

A2-15	PCodE 1000 0000 9999		**PCodE (P.CodE): Pass Code ;** Please remind and write down the new pass code so that access to programming level.	**Settable range: 0000~9999** **Shift Up Down Enter**
A2-16	FLoCK nonE nonE ALL		**FLoCK (F.LoCK): Function Lock) ;** There are 4 levels programmable for lock that the function is to avoid miss-setting.	**Programming:** nonE **(None):** no lock at all. User can access to user level for checking and setting. USEr **(User Level):** User level lock. User can access to user level for checking, but can not setting. EnG **(Programming Level):** Programming level lock. User can access to programming level for checking, but can not setting. ALL **(All Level):** All lock. User can access to all level for checking, but can not setting. **Up Down Enter**

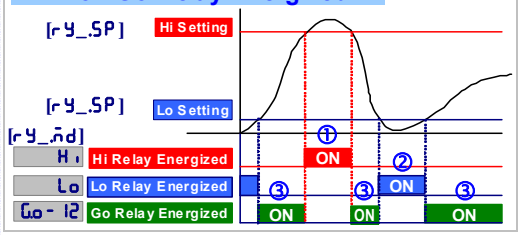
■ RELAY GROUP (The group will not be displayed except the relay function is to be specified)

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
rELAY GroUP		**RELAY GROUP INDEX PAGE**		
		In following pages,press ◀ for 1 second to back RELAY GROUP INDEX PAGE		
B-1	r.Sb 0.0 999.9	**r.Sb (rY.Sb): Start band of Relay Output** 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. **Start Delay** **Fig.2** 	**Settable range: 0~9999 counts** **Shift Up Down Enter**	
B-2	r.Sd 0.00.0 9.59.9	**r.Sd (rY.Sd): Relay Output start delay time**	**Settable range:** **0:00.0~9(M):59.9(S)** **Shift Up Down Enter**	
Next Page				

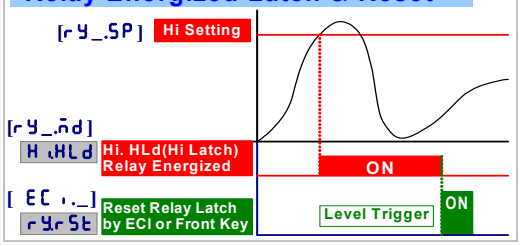
B-3

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

Hi / Lo / Go Relay Energized



Relay Energized Latch & Reset



Programmable:

oFF (Turn off the Relay) :
Turn off the Relay and indication LED.

Lo (Low Level Energized) :
Low Level Energized;
Relay will energize when PV < Set-Point.

Hi (High Level Energized) :
High Level Energized;
Relay will energize when PV > Set-Point.

H.HLd / Lo.HLd (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]**.

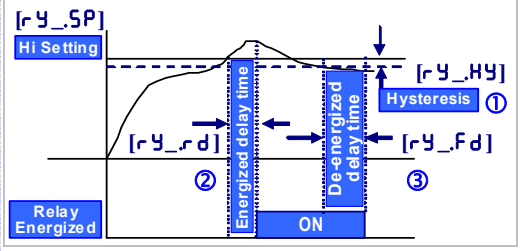
do (Digital Output) :
Digital Output;
Relay is energized by RS485 command directly, but no longer to compare with set-point of relay.

Up Down Enter

B-4

rY1.HY(rY1.HY): Relay 1 Hysteresis

Energized / De-energized Delay & Hysteresis Fig.3



Settable range: 0~5000 counts

Shift Up Down Enter

B-5

rY1.rd (rY1.rd): Relay 1 energized delay time

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

Shift Up Down Enter

B-6

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

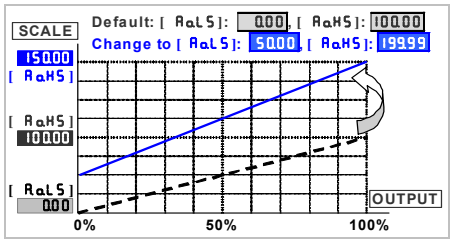
Settable range:
0:00.0~9(M):59.9(S)

Shift Up Down Enter

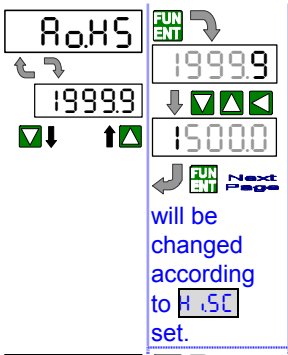
Next Page

B-7	rY2.Md Hi Hi Hi.HLd	**rY2.Md (rY2.Md): Relay 2 energized mode**	…. as same as Relay 1 Energized Mode… **Programmable:** oFF(off) / Lo(Lo) / Hi(Hi) / Hi.HLd(Hi.HLd) / Lo.HLd(Lo.HLd) / do(DO) **Up Down Enter**
B-8	rY2.HY 0.0 0.0 5.0.0	**rY2.HY(rY2.HY): Relay 2 Hysteresis**	**Settable range: 0~5000 counts** **Shift Up Down Enter**
B-9	rY2.rd 0.0.0 0.0.0 9.5.9.9	**rY2.rd (rY2.rd): Relay 2 energized delay time**	**Settable range:** **0:00.0~9(M):59.9(S)** **Shift Up Down Enter**
B-10	rY2.Fd 0.0.0 0.0.0 9.5.9.9	**rY2.Fd (rY2.Fd): Relay 2 de-energized delay time**	**Settable range:** **0:00.0~9(M):59.9(S)** **Shift Up Down 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	**ANALOGUE GROUP INDEX PAGE**		
	In following pages,press ◀ for 1 second to back ANALOGUE GROUP INDEX PAGE			
D-1	Ao.tYP R4-20 R4-20 u.0-10	**Ao.tYP (Ao.tYP): Analogue Output type** 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)	**Programmable:** **Voltage Output:** u.0-10(0~10V) / u.0-5(0~5V) / u.1-5(1~5V) **Current Output:** R0-10(0~10mA) / R0-20(0~20mA) / R4-20(4~20mA) **Up Down Enter**	
D-2	Ao.LS 0.0 0.0 5.0.0	**Ao.LS (Ao.LS): Analogue Output relative Low Scale** 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 [Ao.LS] (Ao.LS) to be 50.00. At meantime, the output signal will be 4mA when the present value is 50.00.	**Settable range: -19999~29999** **Shift Up Down Enter** 	
Next Page				

D-3



Ao.HS (Ao.HS): Analogue Output relative High Scale

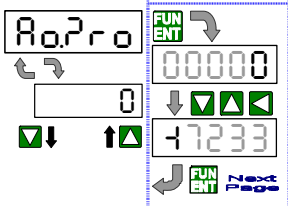
To set the higher display value versus high output range (as like as 20mA in R4-20)

Ex. Output range set to be R4-20 (4~20mA) is relative to display 0~199.99. User can set the [Ao.HS] (Ao.HS) to be 15000. At meantime, the output signal will be 20mA when the present value(PV) is 150.00.

Settable range: -19999~29999

Shift Up Down Enter

D-4



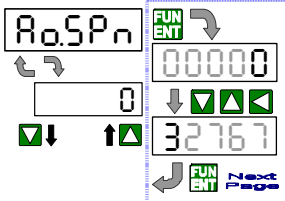
Ao.Pro (Ao.Zro): Fine Zero Adjustment for Analog Output

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.

Settable range: -38011~+27524

Shift Up Down Enter

D-5



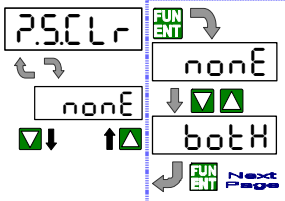
Ao.SPn (Ao.SPn)Fine Span Adjustment for Analog Output

Users can get Fine span Adjustment for analogue output by front key of the meter as like as [Ao.Pro] (Ao.Zro).

Settable range: -38011~+27524

Shift Up Down Enter

D-6



Z.S.CLr (Z.S.CLr)Clear Fine Zero / Span Adjustment for Analog Output

Programmable:

nonE **(None):** Do not clear

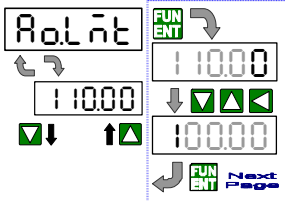
Ao.Pro **(Ao.Zro):** Clear low adjust

Ao.SPn **(Ao.SPn):** Clear high adjust

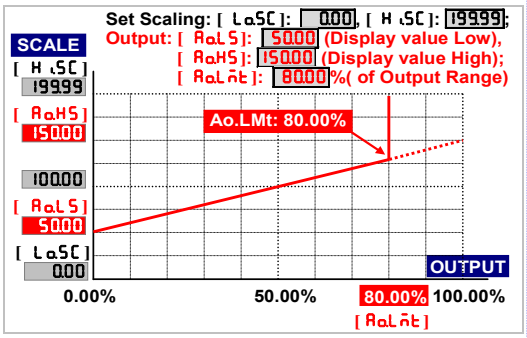
both **(both):** Clear low & high adjust

Up Down Enter

D-7



Ao.LMt (Ao.LMt): Analog Output High Limit

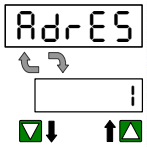
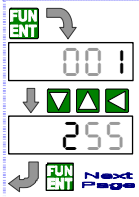
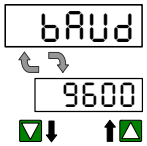
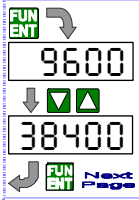
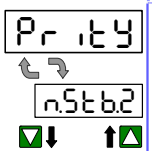
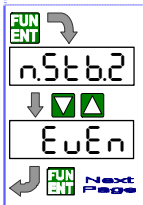


Settable range:

0.00~110.00% of FS

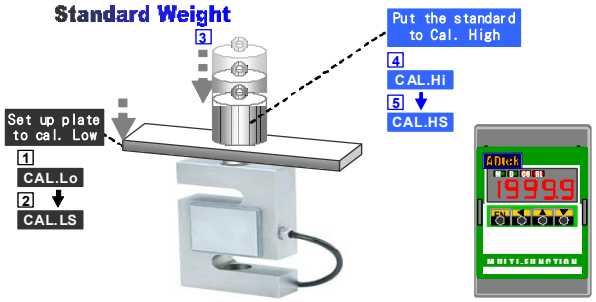
Shift Up Down Enter

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

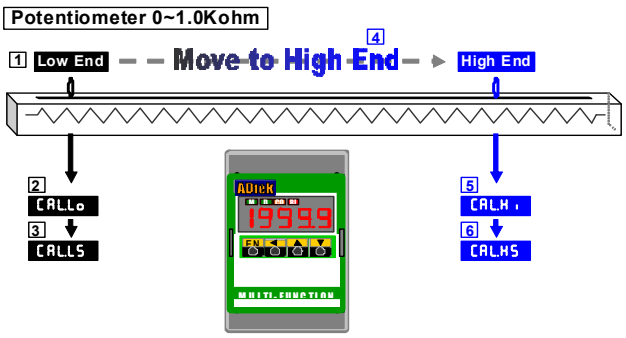
	INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
			**ANALOGUE GROUP INDEX PAGE**		
		In following pages,press ◀ for 1 second to back RS485 GROUP INDEX PAGE			
E-1			**AdrES (AdrES): Device number of the meter**	**Settable range: 1~255** **◀Shift ▲Up ▼Down ENTER Enter**	
E-2			**bAUd (bAUd): Baud rate**	**Programmable:** 1200 / 2400 / 4800 / 9600 / 19200 / 38400 **▲Up ▼Down ENTER Enter**	
E-3			**PrItY (PritY): Parity**	**Programmable:** n.Stb.1 **(n.Stb.1):** None, 1 stop bit n.Stb.2 **(n.Stb.2):** None, 2 stop bit odd **(odd):** odd EvEn **(EvEn):** Even **▲Up ▼Down ENTER Enter**	

Field Calibration Group

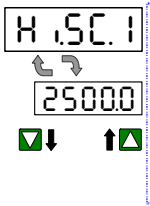
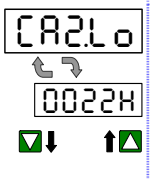
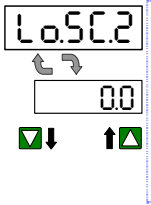
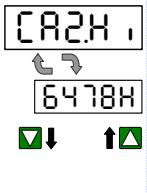
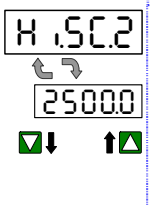
Please according to the sequence to do the Field Cal.
(1⇨2⇨3⇨4⇨5)



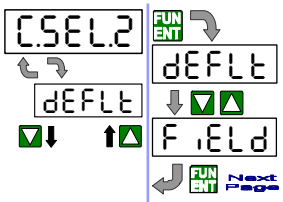
Please according to the numbers to do the field calibration
(1⇨2⇨3⇨4⇨5⇨6)



INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
16888		**Measuring Page**		
EntEr / PCodE		**Pass Code Page**		
EntEr / FCodE	0000 → 2000	**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.	
Pass Code	2000			
NO / YES		**Adjust the structure of machinery of input 1 to the lower signal output status(or any lower status).**		
F-1 CA 1Lo / 0022H	052EH	**CA 1Lo (CA1.Lo): Field Calibration Low of input 1** The low calibration is not need the exactly "zero" to calibrate because of the "field calibration" function could be calibrate any lower point.	▶Waiting for the value till stable, pressed FUN ENT Key to read signal low of sensing device. ▶Waiting for above reading stable (around 3~5seconds), press FUN ENT Key again to complete the calibration lower point, and go to [Lo.SC.1].	
F-2 Lo.SC.1 / 0.0	00000 → 00000	**Lo.SC.1 (Lo.SC.1): Low Scale relative Field Calibration Low of input 1**	**Settable range: -19999~29999** **◀Shift ▲Up ▼Down FUN ENT Enter**	
		Adjust the structure of machinery of input 1 to the higher signal output status(or any higher status).		
F-3 CA 1H ı / 6478H	6996H	**CA 1H ı (CA1.Hi): Field Calibration High of input 1** The high calibration is not need the exactly "span" to calibrate because of the "field calibration" function could be calibrating any higher point.	▶Waiting for the value till stable, pressed FUN ENT Key to read signal high of sensing device. ▶Waiting for above reading stable (around 3~5seconds), press FUN ENT Key again to complete the calibration higherer point, and go to [H ı.SC.1]。	
Next Page				

F-4		**H .SC. 1 (Hi.SC.1): High Scale relative Field Calibration High of input 1**	**Settable range: -19999~29999** **Shift Up Down Enter**
F-5		**C.SEL. 1 (C.SEL.1): Calibration parameter selection of input 1** 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:** dEFLt **(default):** factory calibration points and factors F .ELd **(field):** field calibration points and factors **Up Down Enter** ► **If the user select field calibration of the [Lo.SC. 1] (step A1-4) and [H .SC. 1] (step A1-5) will be** replaced by **the [CALLS] and [CALHS]** 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 [Lo.SC. 1] (step F-2) and [H .SC. 1] (step F-4).** ► **Please double check the [Lo.SC. 1] (step A1-4) and [H .SC. 1] (A1-5)** whether **are correct after selection the** dEFLt **or** F .ELd**.**
		Adjust the structure of machinery of input 2 to the lower signal output status(or any lower status).	
F-6		**CA2.Lo (CA2.Lo): Field Calibration Low of input 2** The low calibration is not need the exactly "zero" to calibrate because of the "field calibration" function could be calibrate any lower point.	►Waiting for the value till stable, pressed Key to read signal low of sensing device. ►Waiting for above reading stable (around 3~5seconds), press Key again to complete the calibration lower point, and go to **[Lo.SC.2].**
F-7		**Lo.SC.2 (Lo.SC.2): Low Scale relative Field Calibration Low of input 2**	**Settable range: -19999~29999** **Shift Up Down Enter**
		Adjust the structure of machinery of input 2 to the higher signal output status(or any higher status).	
F-8		**CA2.H . (CA2.Hi): Field Calibration High of input 2** The high calibration is not need the exactly "span" to calibrate because of the "field calibration" function could be calibrating any higher point.	►Waiting for the value till stable, pressed Key to read signal high of sensing device. ►Waiting for above reading stable (around 3~5seconds), press Key again to complete the calibration higherer point, and go to **[H .SC.2]**。
F-9		**H .SC.2 (Hi.SC.2): High Scale relative Field Calibration High of input 2**	**Settable range: -19999~29999** **Shift Up Down Enter**

Next Page

F-10		**C.SEL.2 (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:** dEFLt **(default):** factory calibration points and factors F.CLd **(field):** field calibration points and factors **Up Down Enter** ► **If the user select field calibration of the [LoSC.2] (step A2-4) and [HiSC.2] (step A2-5) will be** replaced by **the [CALLS] and [CALHS]** 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.2] (step F-7) and [HiSC.2] (step F-9).** ► **Please double check the [LoSC.2] (step A2-4) and [HiSC.2] (A2-5)** whether **are correct after selection the dEFLt or F.CLd.**
		Go back to Measuring Page	

■ TROUBLE SHOOTING

Display Issue:

PROBLEM	CHECKING LIST	REMEDY
Display shows ouFL -ouFL	**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)?	**A.**Please check the [AiLo] and [AiHi] in [inPUt GroUP] are correct or not. **B.**Please changes another meter that is matching in the field.
	3. To inspect whether did the wires connect correct and secure or not?	**A.**Please checks carefully the connection diagram of label on the meter. **B.**Please uses the terminals(Y, Ring or cord end terminal) to avoid the risk of insecure.
Incorrect ion display value or out of accuracy	**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 [AiLo] and [AiHi] in the [inPUt GroUP] whether did the both set correct or not ? Generally, the [AiLo] is 0.00 % and [AiHi] is 100.00 %, 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 **[HiSC](A1-5 or A2-5)** and **[LoSC](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 **[PSCLr](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 **[CALLS](F-2 or F-7)** and **[CALHS](F-4 or F-9)** both are matched the measuring range of sensor.

Jittery Display	**1.**To inspect the input signal is jittery or not?	**A.**If the input signal is jittery continuously, please set higher value in **[AuG](A1-12 or A2-12)** or **[AuAuG](A1-13 or A2-13)** **B.**If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in **[dF iLt](A1-14 or A2-14)** **C.**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.
	2.To inspect the input signal is stable.	**A.**If the input signal is jittery continuously, please set higher value in **[AuG](A1-12 or A2-12)** or **[AuAuG](A1-13 or A2-13)** **B.**If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in **[dF iLt](A1-14 or A2-14)** **C.**Please connects an isolation transformer as close as meter in power lines.
Display shows ”-----“	To inspect display function **[dSPLY]**. It's maybe to be set to rS485	Please check the **[dSPLY](A1-10 or A2-10)** in **[inPUt GroUP]** and change the function setting from rS485 to Pu.
Display value doesn't change	To inspect display function **[dSPLY]**. It's maybe to be set to HAL.Hd(maximum hold) or H inHd(minimum hold), and the M.H LED is brighten.	Please check the **[dSPLY](A1-10 or A2-10)** in **[inPUt GroUP]** and change the function set from HAL.Hd or H inHd to Pu.

Relay Output Issue:		
PROBLEM	**CHECKING LIST**	**REMEDY**
The parameters of Relay doesn't shown	Check if the label of meter for detail specification.	**A.**Please check the product number and output(O/P:_____) description again for confirmation the relay output is specified or not? **B.**Please send back to our sales window, or order another meter with relay function.
Relay cans not action.	**The relay energized, but square red LED doesn't bright**	
	1.Check the energized mode	Please check the **[rY.Ad](B-3/7)** in the **[rELAY GroUP]**
	2.Check the delay time and delay band in the start delay function.	Please check whether the [rY.Sb] (B-1) did is too wide and **[rY.Sd](B-2)** is too long in **[rELAY GroUP]** or not?
	3. Check the energized delay time	Please check whether did the **[rY.rd](B-5/9)** is too long in **[rELAY GroUP]** or not?
	The relay energized, but square red LED dose bright	
	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	

Analogue Output Issue:		
PROBLEM	**CHECKING LIST**	**REMEDY**
Incorrect ion analogue output value or out of accuracy	**1.** To inspect the output signal type (V/A/mA..) or range of meter whether did match with signal in the field or not?	**A.**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. **B.**Please confirm the output type is correct and check the range in **[AotYP](D-1)** of **[Ao GroUP]**
	2. Check the Analogue output high and low setting.	**A.**Please check the **[AoLS](D-2)** and **[AoHS](D-3)** in **[Ao GroUP]**.
Jittery	**Analogue output is according to the display**	

Analogue Output	1.Check if the display is jittery	**A.**If the input signal was jittery continuously, please set higher value in **[AuG](A1-12 or A2-12)** or **[AuAuG](A1-13 or A2-13)** **B.**If the input signal is jittery with a uncertain period that caused by the inductive load actions, please set higher value in **[dF iLt](A1-14 or A2-14)** **C.**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.
	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
Can not link	Check if the square orange LED of RS485 doesn't bright.	**A.**Please check the **[AdrES](E-1)**、**[bAUd](E-2)** and **[Pr tY](E-3)** in **[rS485 GroUP]** that both have to match the Host. **B.**Please check the wiring A(+) and B(-) are correct or not? **C.**If user uses a converter (RS485/RS232 or RS485/USB..), please check the converter of setting and wiring is correct or not? **D.**Please check the protocol of host is Modbus RTU Mode
Reply wrong data from the meter	**1.**Check if the square orange LED of RS485 dose bright, but no reply.	**A.**Please confirms the CHECH SUM program is correct. **B.**Please check the interval of each command has to over 3.5byte.
	2. Check if the square orange LED of RS485 dose bright, but reply Error.	**A.**Please checks the address table of RS485 to assume whether did the address right or not? **B.**Please checks the start address and data format are correct. **C.** 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.

■ 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

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	
rY 1.SP	0002h	-19999~99999	Relay1 Set Point (High word)	10000	R/W	
rY 1.SP	0003h	-19999~99999	Relay1 Set Point (Low word)	10000	R/W	
rY 1.SP	003Ah	-19999~99999	Relay1 Set Point (High word)	10000	R/W	★
rY 1.SP	003Bh	-19999~99999	Relay1 Set Point (Low word)	10000	R/W	★
rY2.SP	003Ch	-19999~99999	Relay1 Set Point (High word)	10000	R/W	★
rY2.SP	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	
nAX.12	0006h	-19999~99999	The Maximum of PV.12 (High word)	0	R	
nAX.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	
Ao.LS	000Ah	-19999~99999	Analogue Output Low Scale (High word)	0	R/W	
Ao.LS	000Bh	-19999~99999	Analogue Output Low Scale (Low word)	0	R/W	
Ao.HS	000Ch	-19999~99999	Analogue Output High Scale (High word)	19999	R/W	
Ao.HS	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	
Pu 1.dP	0010h	0~4	Decimal Point of PV1 **0:** 00000 **1:** 0000.0 **2:** 000.00 **3:** 00.000 **4:** 0.0000	0	R/W	
Pu2.dP	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.rSt	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
A1.1Lo	0016h	0.00~100.00%	Input 1 Low	0.00%	R/W	
A1.1H1	0017h	0.00~100.00%	Input 1 High	100.0%	R/W	
A1.2Lo	0018h	0.00~100.00%	Input 2 Low	0.00%	R/W	
A1.2H1	0019h	0.00~100.00%	Input 2 High	100.0%	R/W	
Lo.SC.1	001Ah	-19999~29999	Low Scale of Input 1	0	R/W	
H1.SC.1	001Bh	-19999~29999	High Scale of Input 1	19999	R/W	
Lo.SC.2	001Ch	-19999~29999	Low Scale of Input 2	0	R/W	
H1.SC.2	001Dh	-19999~29999	High Scale of Input 2	19999	R/W	
Pu1.Po	001Eh	-19999~29999	PV1 ZERO	0	R/W	
Pu1.Sn	001Fh	-19999~29999	PV1 SPAN	0	R/W	
P.SCL1	0020h	0~3	The clear of PV1_ZERO and PV1_SPAN **0:** None **1:** PV1_ZERO **2:** PV1_SPAN **3:** Both	0	R/W	
Pu2.Po	0021h	-19999~29999	PV2 ZERO	0	R/W	
Pu2.Sn	0022h	-19999~29999	PV2 SPAN	0	R/W	
P.SCL2	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	
Lo.Ct.1	0025h	-19999~19999	Low Cut of PV1	0	R/W	
Lo.Ct.2	0026h	-19999~19999	Low Cut of PV2	0	R/W	
AuG	0027h	1~99	Average	5	R/W	
dF.1Lt	0028h	0~99	Digital Filter	0	R/W	
P.CodE	0029h	0000~9999	Pass Code	1000	R/W	
F.LoCK	002Ah	0~3	Function Lock **0:** none **1:** User Level **2:** Engineer Level **3:** All	0	R/W	
Pu.12=	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
ry.Sb	002Ch	0000~9999	Start Band of Relay	0	R/W	
ry.Sd	002Dh	0000~5999 (0.1second)	Start Delay Time of Relay	0	R/W	
ry1.Md	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	
ry1.HY	002Fh	0000~5000	Hysteresis of Relay1	0	R/W	
ry1.rd	0030h	0000~5999 (0.1second)	Energized Delay Time of Relay1	0	R/W	
ry1.Fd	0031h	0000~5999 (0.1second)	De-Energized Delay Time of Relay1	0	R/W	

Name	Address	Range	Explain	Initial	Write/Read	Note
rY 1Fnd	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	★
rY 1HY	003Fh	0000~5000	Hysteresis of Relay1	0	R/W	★
rY 1rd	0040h	0000~5999 (0.1second)	Energized Delay Time of Relay1	0	R/W	★
rY 1Fd	0041h	0000~5999 (0.1second)	De-Energized Delay Time of Relay1	0	R/W	★
rY2.Fnd	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	★
rY2.HY	0043h	0000~5000	Hysteresis of Relay2	0	R/W	★
rY2.rd	0044h	0000~5999 (0.1second)	Energized Delay Time of Relay2	0	R/W	★
rY2.Fd	0045h	0000~5999 (0.1second)	De-Energized Delay Time of Relay2	0	R/W	★
rY.rSt	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
AotYP	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	
P.SCLr	0034h	0~3	The clear of AO_ZERO and AO_SPAN **0:** None **1:** AO_ZERO **2:** AO_SPAN **3:** Both	0	R/W	
AoLnt	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 tY	0038h	0~3	RS485 parity **0:** n-8-1 **1:** n-8-2, **2:** odd, **3:** even,	1	R/W	

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Printed in Taiwan.

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