CS1-VA	VOLTAGE / CURRENT METERS
CS1-PR	DC SIGNAL (20mA/10V) INDICATOR
CS1-SG	STRAIN GAUGE / LOAD CELL INDICATOR
CS1-PM	POTENTIOMETER INDICATOR
CS1-RS	RESISTANCE(2 W) INDICATOR
CS1-T	TEMPERATURE INDICATOR
	OPERATION MANUAL

■ DESCRIPTION

For the various measuring requirement, the CS1 series indicator provide simple and low cost with high accuracy measurement, display, control or communication (Modbus RTU mode) such as AC voltage/Current, DC process signal 0~10V/4~20mA, Strain Gauge/Load Cell, Potentiometer, Resistance, Temperature and so on.

They have been designed optional 1 of 3 kinds for 1 Relay, 1 Analogue or 1 RS485 port with flexible display function such as max/mini hold, PV hold relative PV…..etc that very useful in testing equipment and others.

■ FEATURES

- 1 relay, 1 Analogue output or RS 485 communication port can be selected one in option
- Relay for Hi / Lo energized with Start Delay / Hysteresis / Energized & De-energized Delay / Relay Energized Latch…etc functions
- CE Approved

[CS1-VA   VOLT / CURRENT METER]
- Measuring Voltage 0~600V or Current 0~10A ; DC / AC / TRMS
- Accuracy: AC: ± 0.1% f.s.; DC: ± 0.04% f.s.; Display Range: -19999~+29999

[CS1-PR   DC SIGNAL INDICATOR]
- Measuring DC 0~10V or 0(4)~20 mA in one indicator(input code: AV)
- Accuracy: ± 0.04% f.s.; Display Range: -19999~+29999

[CS1-SG   S TRAIN GAUGE INDICATOR]
- Measuring ranges of Load Cell or Strain Gauge from 0~1.0/~2.0/~4.0 mV/V or 0~10.0/~20.0/~40.0 mV/V and specified with excitation supply DC 5V or 10V, 40mA
- Accuracy: ± 0.04% f.s. ; Display Range: -19999~+29999
- Field calibration of load cell or strain gauge to meet the system requirement with high/low calibrations which it saved test time and keep accuracy

[CS1-PM   POTENTIOMETER INDICATOR]
- Measuring Potentiometer 0~50Ω/~2.0KΩ; 0~2.0KΩ/~100.0KΩ (3 wire)
- Accuracy: ± 0.04% f.s. ; Display Range: -19999~+29999
- Field calibration of potentiometer to meet the system requirement with high/low calibrations which it saved test time and keep accuracy

[CS1-RS   RESISTANCE INDICATOR]
- Measuring Resistance 0~200.00Ω/2000.0Ω/20.000KΩ/200.00KΩ (2 wires)
- Accuracy: ± 0.04% f.s. ; Display Range: -19999~+29999
- Field calibration of resistance to meet the system requirement with high/low calibrations which it saved test time and keep accuracy

[CS1-T   TEMPERATURE INDICATOR]
- Measuring Pt100Ω; T/C: K,J,E,T(the range will be fix, pleases specified the exactly input type in ordering)
- Accuracy: Pt100: ± 0.1% f.s.; T/C: ± 0.2% f.s.; Display Range: -19999~+29999(according to the seneor type)

■ APPLICATIONS

■ Models
- **CS1-VA** Switch Boards / Motor Control / Machinery / Testing Equipments
- **CS1-PR** Machinery Control / Process Control Systems for pressure, level,……..sensing transducers
  Automation System / Testing Equipments
- **CS1-SG** Weighting indication, control and Alarm / Machinery Control / Tension and others test equipment
- **CS1-PM** Position indication, control and Alarm / Machinery Control / Angle of Value Control
- **CS1-RS** Resistance test as like as coil / Tap of transformor indication
- **CS1-T** Temperature measuring

■ Functions
- **Safty & Protection** Hi or Lo alarm and latch(`Hi.HLd` / `Lo.HLd`)
- **Testing & Measuring** Maximum/Minimum hold(`MAxH` / `min.H`), PV hold(`Pu.HLd`), Relative PV/Tare/△PV(`rEL.Pu`), Field calibration with sensor
- **Remote Monitoring** RS485 communication port, Display function(`rS485`),

■ 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	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	u	Y	Y	Y	?

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

■ Input & Scaling

■ Input type [A t.YP] for CS1-PR
Programming range: Voltage:0~10V/0~5V/1~5V;
Current: 4~20mA/0~20mA/0~10mA

It supports dual type input 0~10V and 0(4)~20mA between 3 terminals in one meter. Please specify the ordering code AV for input range. And, programming the function [A t.YP] to co-ordinate with the input range and wiring terminals.

■ Scaling Function [Lo.SC] & [H i.SC]

Setting the [Lo.SC] (Low scale) and [H i.SC] (High scale) in [inPUt GroUP] are relative to input signal. Reverse scaling will be done too. Please refer to the figure as below,

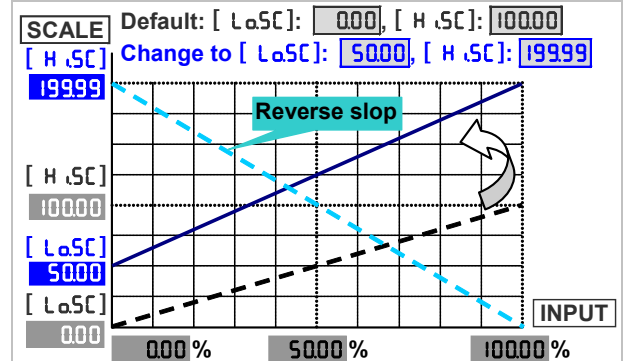*Lower display resolution may caused by more narrow scale.

■ Display Functions

■ Max / Mini recording:
In order to review & trace the drifting PV, the meters will keep the values of maximum and minimum in [USEr LEuEL] during power on.

■ 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 [Lo.SC](Low scale) and [H i.SC] (High scale) setting.

- #### Max. Hold `MAxHd` or Mini. Hold `minHd` for PV
When the [dSPLY] function in [inPUt GroUP] set to be `MAxHd`(Max. Hold) or `minHd`(Mini. Hold), that the meter will still display the values of PV in maximum(or minimum) and the relative square orange LED will be bright during power on, until manual reset by front key in [USEr LEuEL] or Down Key function has been done. The meter will update immediatelly new max./mini. values after press Down Key again.

Please paste the sticker₁ **M.H** on the right side of orange square LED to identify the status of display.
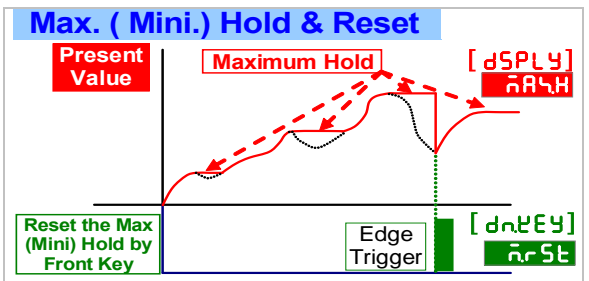

- #### Remote display by RS485 command
In past, The meter normally receive 4~20mA or 0~10V from AO card or BCD card of PLC. We built-in a new solution by RS485 which it can save costs of AO and wiring connecting to PLC simultaneously.

When the [dSPLY] function set to be -S485, the LED display no longer appear the input signal on the meter then the PV screen will show the data from RS485 command.

■ PV(Present value) Hold PuHLd

When the [dnKEY](Down key function) set to be PuHLd(PV Hold) function in [InPUt GroUP], The display will be hold, when the down key has been pressed until the down key pressed again.

Please paste the sticker ECI PV.H on the right side of green square LED of ECI to identify the status of display.

PV Hold & Reset
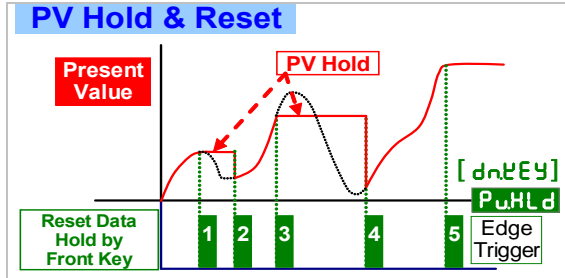
■ Low Cut [LoCUt]

Settable range from -19999~+29999 digits.

The users can set the value range.

1) 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.

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.
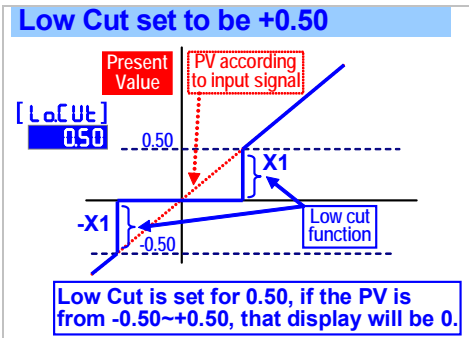
2) If set the negative value (X2) here to display "X2" which it expressed to be low-cut the PV that it's under the X2 setting value;

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.

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.
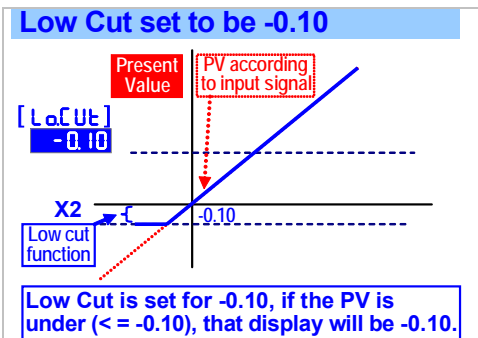
■ Digital Fine Adjustment [PuPro] & [PuSPn]
Settable range from -19999~+29999 ;

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

The adjustment can be cleared in function [P.S.CLr].
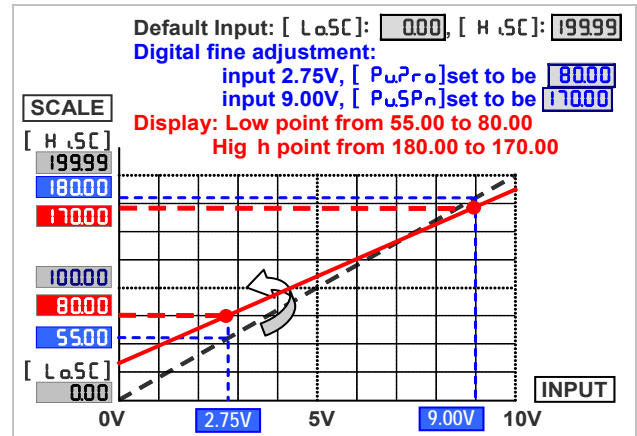
■ Front Key Functions

Users can set the ▼down key of front panel to be the functions as like as Relative PV(Tare) / PV Hold / Reset for max(mini) hold / Reset for relay energized latch.

Ex. The [dnKEY] function set to be rEL.Pu in [InPUt GroUP]. When user presses ▼Key, the PV will show relative value until press ▼Key again.

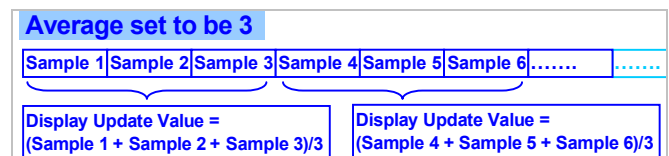## ■ Reading Stable Functions

■ Average Display update
Settable range: 1~99 times;

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

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

The meter's sampling is 15cycle/sec. If the [AuG](Average) set to be 3, the meter will express the sampling 3 readings and calculating the average then update the display once. At meantime, the display update will be 5 times/sec.

Average set to be 3

Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	…….	…….

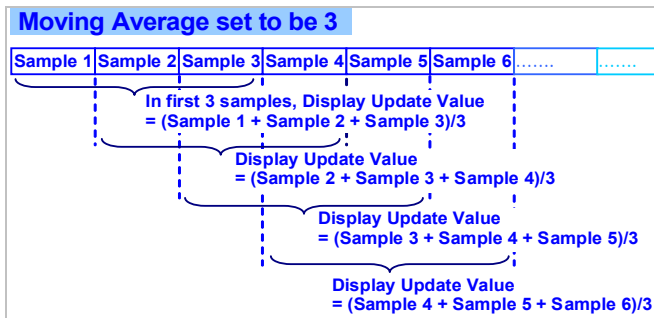| Display Update Value = (Sample 1 + Sample 2 + Sample 3)/3	Display Update Value = (Sample 4 + Sample 5 + Sample 6)/3

■ Moving Average update
Settable range: 0(no function)/1~10 times;

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

Remark: The higher moving average setting wouldn't impact the response time of Relay and Analogue output slower after first 3 samples.

The meter's sampling is 15cycle/sec. If the [ᄂᄆ∩ᄆᄂᄆᄃ](Moving Average) set to be [3], in the first cycle will be same as average function. In following cycle, the function will get a new fourth reading and throw away first reading to be newer 3 reading, and calculating the average then update display. At meantime, the display update will be 15 times/sec.
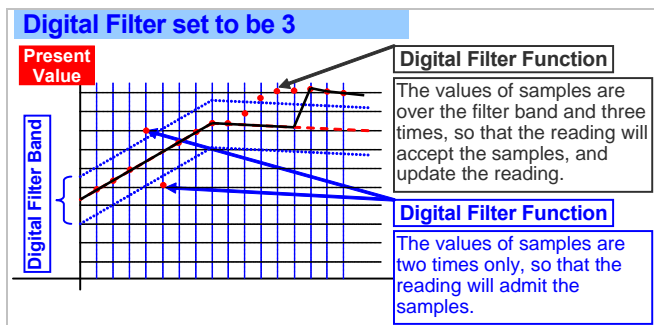
Moving Average set to be 3

| Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | .... | .... |

In first 3 samples, Display Update Value = (Sample 1 + Sample 2 + Sample 3)/3

Display Update Value = (Sample 2 + Sample 3 + Sample 4)/3

Display Update Value = (Sample 3 + Sample 4 + Sample 5)/3

Display Update Value = (Sample 4 + Sample 5 + Sample 6)/3

■ Digital filter [dF ıᄂᄂ]
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.

Digital Filter set to be 3

Present Value

Digital Filter Band

Digital Filter Function
The values of samples are over the filter band and three times, so that the reading will accept the samples, and update the reading.

Digital Filter Function
The values of samples are two times only, so that the reading will admit the samples.

■ Relay Functions

CS1 series offer the 1 relay output with flexible and versatile functions. They can be programmed in [ᄂᄃᄂᄆᄀ ᄃᄂᄋᄋᄓ]. Please refer to the description as following;

■ Relay energized mode Hi / Lo / Hi.HLd / Lo.HLd
- **Hi(Fig.1-①) (H ı):** Relay will be energized, when PV > Set Point
- **Lo(Fig.1-②) (Lo):** Relay will be energized, when PV < Set Point

Hi / Lo Relay Energized   Fig.1
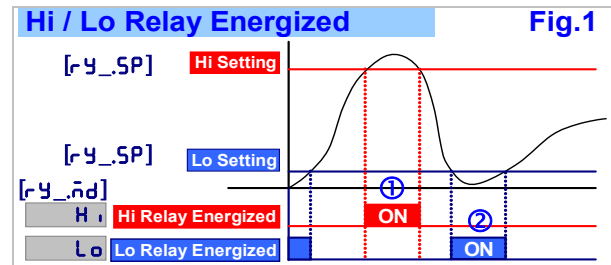
● Hi alarm & latch / Lo alarm & latch (H ı.HLd / Lo.HLd)

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] or reset by down key, if the [d∩ᄇᄃᄓ] function in [ı∩ᄇᄔᄃ ᄂᄃᄋᄃᄂ] has been set to be ᄂᄓᄂ᠍᠍ᄐᄃ.

Relay Energized Latch & Reset
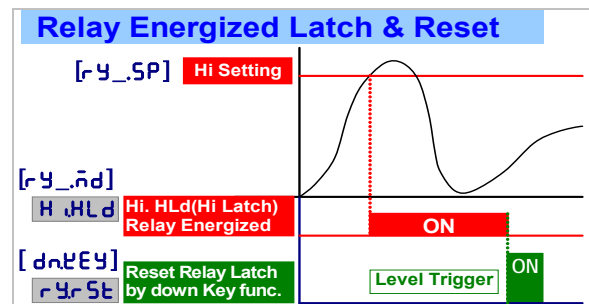
■ Start delay band [ᄂᄓᄃᄐ] and Start delay time [ᄂᄓᄃd]
The functions have Been designed for,

- ● To avoid starting current of inductive motor (6 times of rated current) with alarm.

- ● If the ᄂᄓ_∩d 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 [ᄂᄓᄃᄐ] (Fig.2-①):**
Settable range from 0~9999 Digits

- ● **Start delay time [ᄂᄓᄃd] (Fig.2-②):**
Settable range from 0.0(second)~9(minutes)59.9(seconds);

Start Delay   Fig.2
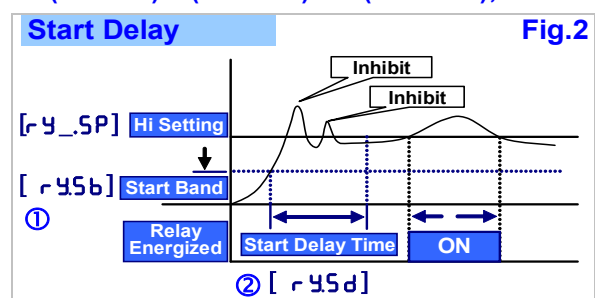
■ Hysteresis [rY_HY] (Fig.3-①)
Settable range from 0~5000 Digits

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)

Fig.3 Energized / De-energized Delay & Hysteresis
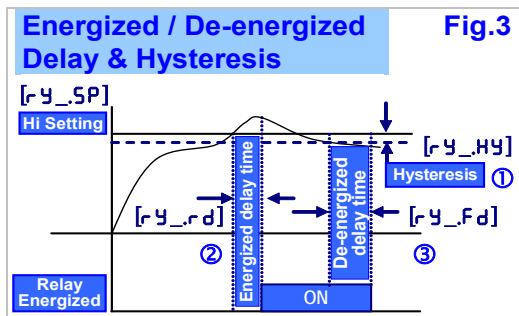
■ Analogue Output Functions

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)
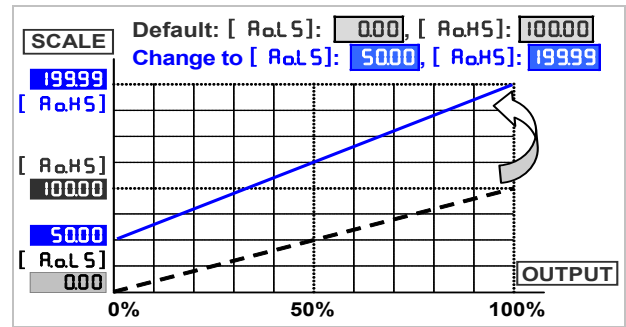
■ Low Output corresponds to Low display value [AoLS]
Settable range: -19999~+29999;

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;

■ RS 485 Communication

CS1 series can be used as Remote Terminal Unit (RTU) for monitoring and controlling in a SCADA (Supervisor Control And Data Acquisition) system.

● 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 [Prity]: Programmable Even / Odd / None
## ● Device Number [AdrES]: Settable 1~255
■ Remote Display function [rS485]

CS1 series has been built in an innovation function call remote display function.

When the [dSPLY] function set to be rS485, At meantime, the display is no longer according to the input signal. The PV screen will show the number from RS485 command & data.

In past, The meter normally receive 4~20mA or 0~10V from AO card or BCD card of PLC. We support a new solution by RS485 writing in so that can save cost of AO and wiring into PLC.

CS1 APPLICATION FOR REMOTE DISPLAY FROM RS485 COMMAND
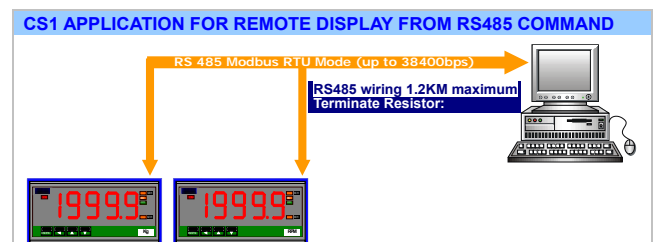
►The display will be shown ----- when the data can not to be sent to the meter due to the communication error.

■ Field Calibration (for CS1-SG / CS1-PM / CS1-RS)

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 CS1-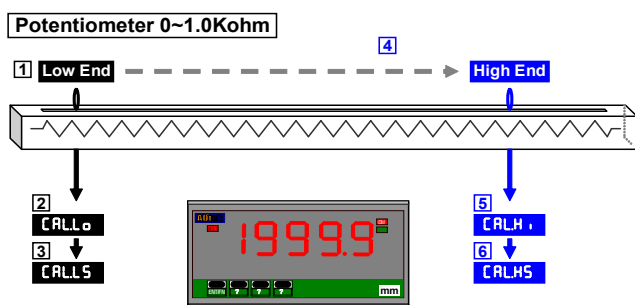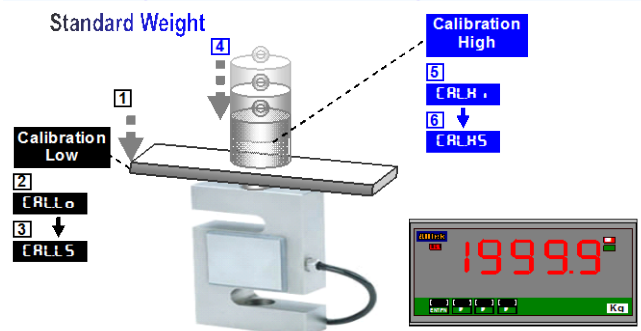SG, CS1-PM and CS1-RS with innovation functions against above to make the engineer operated easily and smoothly that it's called "Field Calibration". The procedures are descripted as below;

- Enter the right pass code [F.CodE] and access to the Field Calibration Level.
- Adjust the structures of machinery or & equipments to be "lower status".
- 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.
- Move next page to the [CAL.Lo] and waiting for the value till stable, then pressed ⊞Key to read the 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 [CAL.LS].
- [CAL.LS] is the page of low scale setting that is relative to the calibration low point.
- Press ▽Key to next function index [CAL.Hi].
- Adjust the structures of machinery or & equipments to be "higher status".
- The high calibration of machinery structure is not need the exactly "span" to calibrate because of the "field calibration" function could be calibrating any higher point.
- In [CAL.Hi] page, waiting for the value till stable, then pressed ⊞Key to to read the signal high of sensing device.
- Waiting for above reading stable (around 3~5seconds), Press ⊞Key again to complete the calibration higher point, and go to [CAL.HS].
- [CAL.HS] is the page of high scale setting that is relative to the calibration high point.
- Press ▽Key to next functions [C.SEL] to select Field.
- [C.SEL](Calibration parameter selection): Field calibration wouldn't change the default calibration. After user completing the field calibration, it can also select default calibration if the user wants.
  - ► 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.
  - ► If the user select field calibration, the [Lo.SC](step A-2) and [Hi.SC](A-3) will be replaced by [CAL.LS] and [CAL.HS] which it can not to be changed by anyone. If user has to change the scaling, it's the only way to access field calibration level to set in [CAL.LS](step F-2) and [CAL.HS](step F-4).
  - ► After selecting the dEFLt or Field, please double check the [Lo.SC](step A-2) and [Hi.SC](A-3) whether are corrected or not?

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

Potentiometer 0~1.0Kohm

① Low End ─ ─ ─ ─ ④ ─ ─ ─ ─ ► High End

② CAL.Lo
③ CAL.LS

1999.9 mm

⑤ CAL.Hi
⑥ CAL.HS

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

Standard Weight

④
Calibration High

⑤ CAL.Hi
⑥ CAL.HS

① Calibration Low
② CAL.Lo
③ CAL.LS

1999.9 Kg

■ ORDERING INFORMATION

CS1-VA-

CS1-VA- [DC/AC/TRMS Input Signal] – [Optional Output] **OPTION** – [Aux. Powered]

CODE	VOLT INPUT	CODE	CURRENT
D	DC measuring	D	DC measuring
A	AC measuring	A	AC measuring
T	TRMS measuring	T	TRMS measuring
V1	0 ~ 199.99 mV	A1	0 ~ 199.99 µA
V2	0 ~ 1.9999 V	A2	0 ~ 1.9999 mA
V3	0 ~ 19.999 V	A3	0 ~ 19.999 mA
V4	0 ~ 199.99 V	A4	0 ~ 199.99 mA
V5	0 ~ 300.0 V	A5	0 ~ 1.9999 A
V6	0 ~ 600.0 V	A6	0 ~ 1.0000 A
VA	0~50 mV	A7	0 ~ 5.000 A
VB	0~60 mV	A8	0 ~ 10.000 A
VC	0~100 mV	AO	Specify A input
VO	Specify V input		

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 5 V / 0 ~ 10 V
I	0 ~ 10mA 0(4)~20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only

CODE	AXU. POWER
A	AC 115/230 V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

CS1-PR-

CS1-PR- [Input Signal] – [Optional Output] **OPTION** – [Excitation Supply] – [Aux. Powered]

CODE	INPUT RANGE
A1	0(4) ~ 20mA / 0 ~ 10mA
V1	0 ~ 10V / 0(1) ~ 5V
AV	0~10V/0(4)~20mA(all in one)
AO	Specify A input
VO	Specify V input

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 5 V / 0 ~ 10 V
I	0 ~ 10 mA 0(4)~20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only.

CODE	EXCIT. SUPPLY
N	None
E24	DC 24V
EO	Specify

CODE	AXU. POWER
A	AC115/230V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

* ADH* & ADL* can not support the excitation supply

CS1-SG-

CS1-SG- [Input Signal] – [Optional Output] **OPTION** – [Excitation Supply] – [Aux. Powered]

CODE	INPUT	CODE	INPUT
S1	1.0mV/V	S8	10.0mV/V
S2	2.0mV/V	S9	20.0mV/V
S3	4.0mV/V	SA	40.0mV/V
SO	Specify		

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 10 mA 0 ~ 10 V
I	0 ~ 10 mA 0(4) ~ 20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only

CODE	EXCITATION
E05	DC 5V
E10	DC 10V
EO	Specify

CODE	AXU. POWER
A	AC 115/230 V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

* ADH* & ADL* can not support the excitation supply

CS1-PM-

CS1-PM- [Input Signal] – [Optional Output] **OPTION** – [Aux. Powered]

CODE	INPUT RANGE
P1	0~50 Ω/- 2.0 KΩ
P2	0~2.0 KΩ/- 100.0 KΩ
PO	Specify input

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 5 V 0 ~ 10 V
I	0 ~ 10 mA 0(4) ~ 20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only

CODE	AXU. POWER
A	AC 115/230V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

CS1-RS-

CS1-RS- [Input Signal] – [Optional Output] **OPTION** – [Aux. Powered]

CODE	INPUT RANGE
R1	0.00Ω ~ 200.00 Ω
R2	0.0Ω ~ 2000.0 Ω
R3	0.000Ω ~ 20.000 KΩ
R4	0.00Ω ~ 200.00 KΩ
RO	Specify

The ranges can be changeable by dip switch.

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 5 V 0 ~ 10 V
I	0 ~ 10 mA 0(4) ~ 20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only

CODE	AXU. POWER
A	AC 115/230V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

CS1−T | Input Signal | **−** | Optional Output | **−** | Aux. Powered

OPTION

CODE	INPUT RANGE
P1	Pt100Ω -50.00~199.99 °C
P2	Pt100Ω -150.0~800.0 °C

CODE	INPUT RANGE
K1	Type K 0.0~1200.0 °C
J1	Type J 0.0~750.0 °C
E1	Type E 0.0~1000.0 °C
T1	Type T 0.0~400.0 °C
R1	T/C type R 400~1600 °C
S1	T/C type S 400~1600 °C
B1	T/C type B 400~1800 °C

CODE	OPTIONAL O/P
N	None
R1	1 Relay
V	0(1) ~ 5 V 0 ~ 10 V
I	0 ~ 10 mA 0(4) ~ 20 mA
8	RS 485

Relay, Analogue Output or RS485 Port can be selected one only

CODE	AXU. POWER
A	AC 115/230V
OPTION 4	
ADH*	AC/DC 85~264V
ADL*	AC/DC 20~56V

* It means RoHS version.

■ INSTALLATION

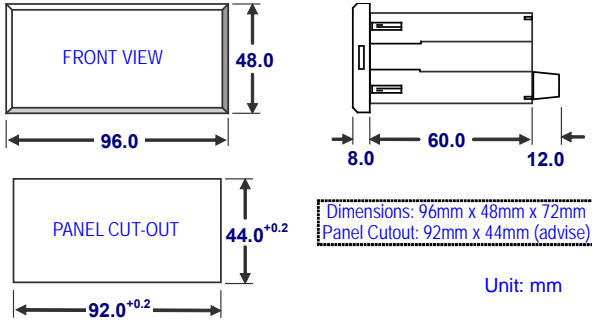**Please check the specification, wire diagrams and functions on the label of the meter before installation.**
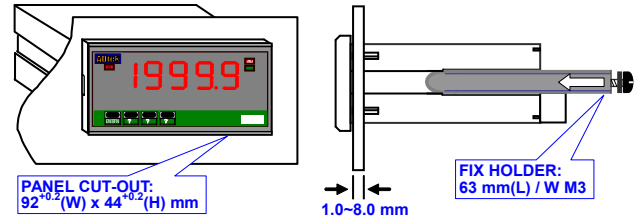
VOLT / CURRENT METERS

MODEL	CS1-VA-AA5-N-A	DATE 2008/8/25
INPUT	0~1.9999 Aac	S/N 78210010-5614
DISPLAY	0~1.9999 Aac	
OUTPUT	xx	SOURCE AC 115/230V

A1 A2 A3 1 2 3 4 5 6 7 8 9 10

SIGNAL INPUT

FG

DC Power AC115V

AC 230V AUX. POWER

CHANG SHUAN   www.csec.com.tw

MODEL	CS1-VA-AA5-N-A
INPUT	0~1.9999 Aac
DISPLAY	0~1.9999 Aac
OUTPUT	xx	SOURCE AC 115/230V

■ Dimensions & Panel Cut Out

FRONT VIEW

48.0

96.0

8.0   60.0   12.0

PANEL CUT-OUT

44.0 +0.2

92.0 +0.2

Dimensions: 96mm x 48mm x 72mm
Panel Cutout: 92mm x 44mm (advise)

Unit: mm

■ Installation

PANEL CUT-OUT:
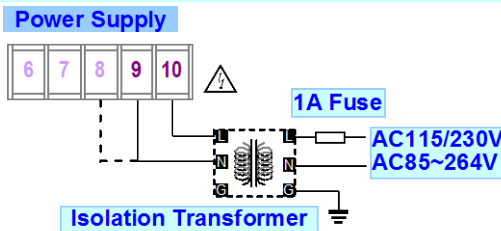92 +0.2 (W) x 44 +0.2 (H) mm
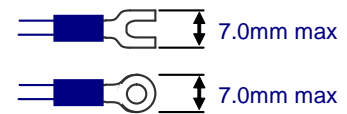
1.0~8.0 mm

FIX HOLDER:
63 mm(L) / W M3

■ Wiring Diagram

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.
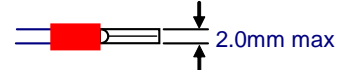
For input and RS485 wiring, it's recommended to use twin with shielding wire.

Power Supply

6 7 8 9 10

1A Fuse

AC115/230V
AC85~264V

L   N

Isolation Transformer

RS485 Communication Port

A   B

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

4   5   6

RS485 Port

Connector

CS1-VA: #A1~A3(Signal Input): 20A/300Vac, M3.5, 12~22AWG; Max torque: 13Kg-cm
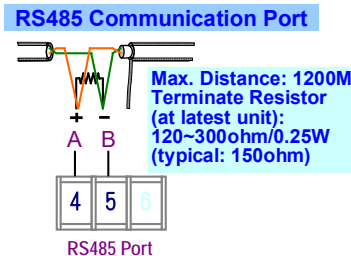
7.0mm max

7.0mm max

Others: 10A 300Vac, M2.6, 16~22AWG, Max torque: 5Kg-cm Please use cord end terminal.

2.0mm max

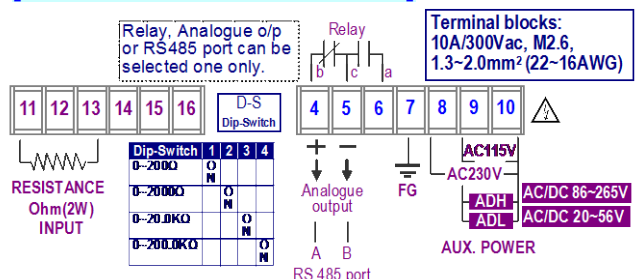Please set the torque of automotive screwdriver to match the limited of terminals.

[CS1-VA Voltage / Current Meter Relay]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay
b c a

Terminal blocks:
10A/300Vac, M2.6,
1.3~2.0mm² (22~16AWG)

A1 A2 A3

SIGNAL INPUT

4 5 6 7 8 9 10

Analogue output

A B
RS 485 port

FG

AC115V
AC230V

ADH   AC/DC 86~265V
ADL   AC/DC 20~56V

AUX. POWER

[CS1-RS Resistance Indicator]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay
b c a

Terminal blocks:
10A/300Vac, M2.6,
1.3~2.0mm² (22~16AWG)

11 12 13 14 15 16

D-S
Dip-Switch

RESISTANCE
Ohm(2W)
INPUT

Dip-Switch	1	2	3	4
0~200Ω	ON			
0~2000Ω		ON		
0~20.0KΩ			ON	
0~200.0KΩ				ON

4 5 6 7 8 9 10

Analogue output

A B
RS 485 port

FG

AC115V
AC230V

ADH   AC/DC 86~265V
ADL   AC/DC 20~56V

AUX. POWER

Input connection

A1 A2 A3

Maxi. Input:
600V or 10A

Current Shunt

CT

Remark:
PT can not short in secondary.
CT can not open in secondary.

[CS1-PM   Potentiometer Indicator]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay

Terminal blocks: 10A/300Vac, M2.6, 1.3~2.0mm² (22~16AWG)

11	12	13	14	15	16

D-S Dip-Switch

4	5	6	7	8	9	10

POTENTIO-METER Ohm(3W) INPUT

Dip-Switch	1	2	3	4	5
0~50.0Ω/ ~2.0KΩ	O N		O	N	
0~2.0KΩ/ ~100.0KΩ			O N		O N

b c a (Relay)

Analogue output

FG

AC115V
AC230V

ADH AC/DC 86~265V
ADL AC/DC 20~56V

A B
RS 485 port

AUX. POWER

[CS1-T   Temperature Indicator]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay

Terminal blocks: 10A/300Vac, M2.6, 1.3~2.0mm² (22~16AWG)

11	12	13	14	15	16

A B b

Pt100Ω

T/C

SIGNAL INPUT

4	5	6	7	8	9	10

b c a (Relay)

Analogue output

FG

AC115V
AC230V

ADH AC/DC 86~265V
ADL AC/DC 20~56V

A B
RS 485 port

AUX. POWER

[CS1-PR   DC Process (10V/20mA) Indicator]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay

Terminal blocks: 10A/300Vac, M2.6, 1.3~2.0mm² (22~16AWG)

11	12	13	14	15	16

0~20mA
0~10V

Excit. Supply DC24V

SIGNAL INPUT

4	5	6	7	8	9	10

b c a (Relay)

Analogue output

FG

AC115V
AC230V

ADH AC/DC 86~265V
ADL AC/DC 20~56V

A B
RS 485 port
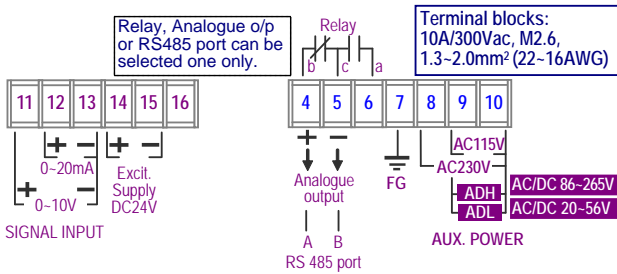
AUX. POWER
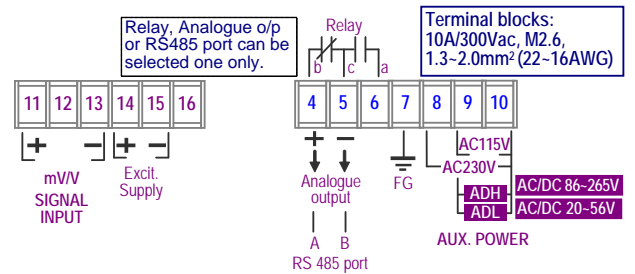
2 wire Transmitter connection

4~20mA Input   24Vdc Excit.S

11	12	13	14	15
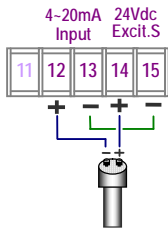
4(0)~20mA Input connection

4~20mA Input   24Vdc Excit.S

11	12	13	14	15

4~20mA

[CS1-SG   Strain Gauge / Load Cell Indicator]

Relay, Analogue o/p or RS485 port can be selected one only.

Relay

Terminal blocks: 10A/300Vac, M2.6, 1.3~2.0mm² (22~16AWG)

11	12	13	14	15	16

mV/V SIGNAL INPUT

Excit. Supply

4	5	6	7	8	9	10

b c a (Relay)

Analogue output

FG

AC115V
AC230V

ADH AC/DC 86~265V
ADL AC/DC 20~56V

A B
RS 485 port

AUX. POWER

Load Cell connection

mV Input   10Vdc Excit.S

11	12	13	14	15

+Vₑ.ₛ.
Output +   Load Cell   - Output
-Vₑ.ₛ.

■ OPERATIONS

■ Front Panel

Relay status Indication

Display screen

Operation Key

Max. Hold status

Comm. status

Front Key function status

Mini. Hold status

Engineer Unit

M'/min	m'/min	Ton/D	L/min	Torr	M'/hr	Kg-cm	cmHg	
mm	cm	M	KM	ft	Yard	ppm	ppb	C.C
g	KG	Ton	T-cm	NT-cm	PH	MPM	L	

■ Numeric Screens

0.8"(20.0mm) red high-brightness LED for 4 2/3 digital present value.

■ I/O Status Indication

● **Relay Energized:** 1 square red LED

RL1 display when Relay 1 has been energized;

● **RS485 Communication:** 1 square orange LED

COM will flash when the meter is receive or send data, and COM flash quickly means the data transient quicker.

● **Max/Mini Hold indication:** 2 square orange LEDs

■ M.H displayed: When the display function has been selected in Maximum or Minimum Hold function.

■ Stickers:

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

Functions 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:**

Hi Hi Energized   Lo Lo Energized

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

● **Front key functions:**

PV.H PV Hold   Tare Tare   DI Digital Input

M.RS Maximum or Minimum Reset

R.RS Reset fo Relay Latch

● **Operating Key:** 4 keys for ▣Enter(Function) / ◀Shift(Escape) / ▲Up key / ▼Down key

■ Pass Code: Settable range:0000~9999;

User must key-in the exactly pass code for access to 【Programming 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 4 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.

■ Front Key Function

The ▼ Down Key can be set to be function as like as **Relative PV(Tare) / PV Hold / Reset for max(mini) hold / Reset for relay energized latch**.

Ex. The [dnKEY] function set to be rEL.Pu in [inPut GroUP]. When user presses ▼Key, the PV will show relative value until press ▼Key again.

■ Error Masage

BEFORE POWER ON, PLEASE CHECK THE SPECIFICATION AND CONNECTION AGAIN.		
SELF-DIAGNOSIS AND ERROR CODE:		
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 ⇌ FAiL	EEPROM occurs error	(Please send back to manufactory for repaired)
AiC.nG ⇌ Pu	Didn't execute the calibrate of Input Signal	(Please process Calibrating Input Signal)
AiC ⇌ FAiL	Input signal calibrated error	(Please check Calibrating Input Signal)
AoC.nG ⇌ Pu	Didn't execute the calibrate of output Signal	(Please process Calibrating Output Signal)
AoC ⇌ FAiL	Output Signal calibrated error	(Please check Calibrating Output Signal)

■ Operating 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
⬛ (= ⬛) **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** **(Escape 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.

Power ON

`88888` **Self-diagnosis**

`CS1.uA` **Display the model**
`CS1.uA` : Volt/Current
`CS1Pr` : DC 10V/20mA
`CS1SG` : Strain Gauge
`CS1Pn` : Potentiometer
`CS1rS` : Resistance
`CS1t` : Rtd T/C

`uEr2.0` **Show the firmware version**
`uEr2.0` : Version 2.0

MEASURING PAGE
`168.88`
Press ◄ 1sec ➡ Access
Escape ◄ Press ◄ 1sec

`P.CodE`
`EntEr`
Enter the password to access Programming Level

NO

◆ **Pass Code** ◆
Default:1000

User Level

Press 🔲 for 1 sec. to back Measuring Page

1-0-1
`168.88`
`Pu`
▼↓ ↑▲
This page will show out. when [dSPLY] set to be rS485.
Pu: Present Value

1-0-1
`ry1.SP`
`100.00`
▼↓ ↑▲
ry1.SP: Relay 1 Set-point
-19999~+29999

2-0-1
`ry.rSt`
`no`
▼↓ ↑▲
ry.rSt : Reset for energized Latch of Relay
`YES` / `no`

3-0-1
`min`
`0.00`
▼↓ ↑▲
min: the Minimum value of PV saving
Checking only

4-0-1
`mAx`
`199.99`
▼↓ ↑▲
mAx: the Maximum value of PV saving
Checking only

5-0-1
`m.rSt`
`no`
▼↓ ↑▲
m.rSt: Reset the saved value of Maximum & Minimum
`YES` / `no`

6-0-1
`CS1.uA`
`uEr2.0`
▼↓ ↑▲
model of the meter firmware version
Checking only

Cyclic to first page

1-0-1
`168.88`
`Pu`
▼↓ ↑▲

Programming Level

Press 🔲 for 1 sec. to back Measuring Page

YES

🔲

`inPut`
`GroUP`
INPUT GROUP

`rELAy`
`GroUP`
RELAY GROUP

`Ao`
`GroUP`
ANALOGUE OUTPUT GROUP

`rS485`
`GroUP`
RS485 GROUP

Programming Level

Press ◄ for 1 sec. to back Measuring Page

| inPut GroUP | **INPUT GROUP** | rELAY GroUP | **RELAY GROUP** | Ao GroUP | **ANALOGUE OUTPUT GROUP** | rS485 GroUP | **RS485 GROUP** |

A-0 | A i.tYP / A.4-20 | **The function is for CS1-PR only. It'll be hiden for other models** **A i.tYP: Analogue Input type and range selection** u0-10 / u0-5 / u1-5 / A0-20 / A4-20 / A0-10

B-1 | rY.Sb / 0 | **rY.Sb: Start band for Relay energized** 0~9999 digits

D-1 | Ao.tYP / A.4-20 | **Ao.tYP: Analogue Output type and range selection** u0-10 / u0-5 / u1-5 / A0-20 / A4-20 / A0-10

E-1 | AdrES / 1 | **AdrES: Device number of the meter** 1~255

A-1 | Pu.dP / 0.00 | **Pu.dP: Decimal Point of PV** 0 / 0.0 / 0.00 / 0.000 / 0.0000

B-2 | rY.Sd / 0.00.0 | **rY.Sd: Start delay time for Relay energized** 0:00.0~9(m):59.9(s)

D-2 | Ao.LS / 0.00 | **Ao.LS: the low point is relative to the lowest of Analogue output** -19999~+29999

E-2 | bAUd / 9600 | **bAUd: Baud rate** 1200 / 2400 / 4800 / 9600 / 19200 / 38400

A-2 | Lo.SC / 0.00 | **Lo.SC: Low scale of PV** -19999~+29999

B-3 | rY1.md / H i | **rY1.md: Relay 1 energized mode** oFF / Lo / H i / LoHLd / H iHLd / do

D-3 | Ao.HS / 100.00 | **Ao.HS: the high point is relative to the highest of Analogue output** -19999~+29999

E-3 | Pr i.tY / n.Stb.2 | **Pr i.tY: Parity** n.Stb.1 / n.Stb.1 / odd / EuEn

A-3 | H i.SC / 0.00 | **H i.SC: High scale of PV** -19999~+29999

B-4 | rY1.HY / 0 | **rY1.HY: Relay 1 Hysteresis** 0~5000counts

D-4 | Ao.Pro / 0.00 | **Ao.Pro: Fine Zero Adjustment for Analog Low Output** -38011~+27524

A-4 | Pu.Pro / 0 | **Pu.Pro: Fine Low point Adjustment for PV display** -19999~+29999

B-5 | rY1.rd / 0.00.0 | **rY1.rd: Relay 1 energized delay time** 0:00.0~9(m):59.9(s)

D-5 | Ao.SPn / 0.00 | **Ao.SPn: Fine Span Adjustment for Analog High Output** -38011~+27524

A-5 | Pu.SPn / 0 | **Pu.SPn: Fine High point Adjustment for PV display** -19999~+29999

B-6 | rY1.Fd / 0.00.0 | **rY1.Fd: Relay 1 de-energized delay time** 0:00.0~9(m):59.9(s)

D-6 | P.S.CLr / nonE | **P.S.CLr: clear fine Zero / Span Adjustment for Analogue output** nonE / Ao.Pro / Ao.SPn / botH

A-6 | P.S.CLr / nonE | **P.S.CLr: Clear Fine Zero / Span Adjustment for PV display** nonE / Pu.Pro / Pu.SPn / botH

Next Page

D-7 | Ao.L m̄ t / 110.00 | **Ao.L m̄ t: Analog Output High Limit** 0.00~110.00%

CS1 SERIES – OPERATION MANUAL (EN) -2013-01-04

A-7

`dSPLY`
`Pu`

dSPLY: Display Function for PV screen
`Pu` / `ñ.in.Hd` / `ñAYHd` / `rS485`

A-8

`Lo.CUt`
`0.00`

Lo.CUt: Low Cut the PV
-19999~+29999

A-9

`AuG`
`5`

AuG: Average update for PV
1(None)~99times

A-10

`ñu.AuG`
`1`

ñu.AuG: Moving Average update for PV
1(None)~10times

A-11

`d.F iLt`
`0`

d.F iLt: Digital filter
0(None)/1~99times

A-12

`dn.KEY`
`nonE`

dn.KEY: Down key function
`nonE` / `rEL.Pu` / `Pu.HLd` / `rEL.Pu` / `ñr.5t` / `r9r.5t`

A-13

`P.CodE`
`0000`

P.CodE: Pass Code setting for access to Programming Level
0000~9999

A-14

`F.LoCK`
`nonE`

F.LoCK: Function Level Lock
`nonE` / `USEr` / `EnG` / `ALL`

■ FIELD CALIBRATION (The function is only for CS1-SG / CS1-PM / CS1-RS)

168.88 MEASURING PAGE

P.CodE / EntEr — Enter the password to access Programming Level

EntEr / F.CodE — Enter the password to access Field Calibration Level

NO ◁ Pass Code ▷ **YES** Press ▣ ➡

default=2000

F-1 **CALLo / 00000**

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

CALLo: Field Calibration Low
- ➢ Press ▣ to read signal of the lower status.
- ➢ Press ▣ again to finish the calibration lower point, and go to next page.

F-2 **CALLS / 00000**

CALLS : the value to be set is relative to Field Calibration lower point
- ➢ Press ▣ to set the value of lower scale

F-3 **CALHi / 00000**

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

CALHi : Field Calibration High
- ➢ Press ▣ to read signal of the higher status
- ➢ Press ▣ again to finish the calibration higher point, and go to next page

F-4 **CALHS / 00000**

CALHS : the value to be set is relative to Field Calibration higher point
- ➢ Press ▣ to set the value of Higher scale

F-5 **C.SEL / dEFLt**

C.SEL : Calibration parameter selection
- ➢ Press ▣ to access the function and stand by selection
- ➢ Press ▽ or △ to select
(default: dEFLd):
Settable: dEFLd / FiELd
dEFLd (default calibration) FiELd (Field calibration)

◘ Once the user select field calibration, the [LoSC](step A-2) and [HiSC](A-3) will be instead of [CALLS] and [CALHS], 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 [CALLS](step F-2) and [CALHS](step F-4).

◘ Please double check the [LoSC](step A-2) and [HiSC](A-3) are correct after selection the dEFLt or FiELd

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)**		
`CS 1.Pr` ↓		**Model** `CS I.uA`: Amp / Volt `CS IrS`: Resistance `CS IPr`: 0~(5)10V / 0(4)~20mA `CS I.SG`: Load Cell / Stran Gauge `CS IPm`: Potentiometer `CS It`: Temperature		
`uEr 1.0` ↓		**Firmware version**		
`16888` ▽↓ ↑△		**Measuring Page**		
Press ◁ for 1 second return to Measuring Page				
0-0 `Pu` ↰↱ `16888` ▽↓ ↑△		**This page will be shown out when, when [dSPLY](step A-07) function has not set to be `Pu`.** **Pu(Pv): Present Value;**		
0-1 `rY 1.SP` `1000.0` ▽↓ ↑△	🔘ENT↱ `1000.0` ↓▽△◁ `2000.0` ↵🔘ENT Nest Page	**rY 1.SP(rY1.SP):Relay 1 Set-point** Please confirm the energized mode of relay 1 before setting.	**Settable range: -19999~+29999** ◁**Shift** △**Up** ▽**Down** 🔘**Enter**	
0-2 `rY.rSt` ↰↱ `no` ▽↓ ↑△	🔘ENT↱ `no` ↓▽△ `YES` ↵🔘ENT Nest Page	**rY.rSt (rY.rSt): Reset for energizing latch of Relay;** If the [rY lmd](step B-3) set to be `H iHLd` or `LoHLd`, 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** 🔘**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,	
0-3 `m in` ↰↱ `0.0` ▽↓ ↑△		**m in(Min): the Minimum value of PV saving;** The meter will save the minimum of PV during power on, until reset in [m.rSt](step 0-5). It will save newest minimum after reset.	**Review only**	
0-4 `mAh` ↰↱ `2999.9` ▽↓ ↑△		**mAh(Max): the Maximum value of PV saving;** The meter will save the maximum of PV during power on, until reset in [m.rSt](step 0-5). It will save newest maximum after reset.	**Review only**	
0-5 `m.rSt` ↰↱ `no` ▽↓ ↑△	🔘ENT↱ `no` ↓▽△ `YES` ↵🔘ENT Nest Page	**m.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.	
NEXT	**PAGE**			

0-6	`CS 1.Pr` `uEr 1.0` ⬇▼ ⬆▲		**Model of the meter** `CS LuA`(CS1-VA): Volt/Currnt `CS 1Pr`(CS1-PR): DC 0~10V / 4~20mA `CS 1SG`(CS1-SG): Strain Gauge / Load Cell `CS 1Pm`(CS1-PM): Potentiometer `CS 1rS`(CS1-RS): Resistance `CS 1t`(CS1-T): Rtd /Thermocouple `uEr 10`(Ver 1.0): Firmware version	**Review only** **It will be announce in our website www.adtek.com.tw, when it has been version changed.**	
0-0-1	`Pu` `16888` ⬇▼ ⬆▲		**Cyclic to first page**		
			Press ◀ for 1 second to back to Measuring Page in any page.		
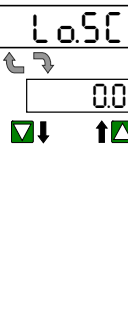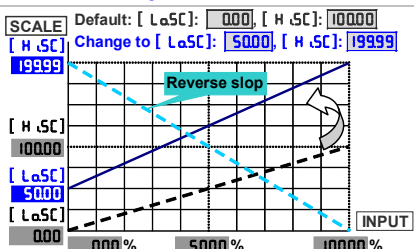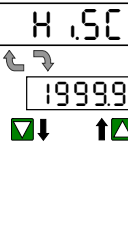
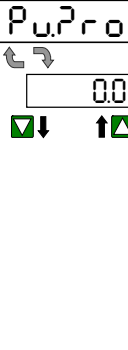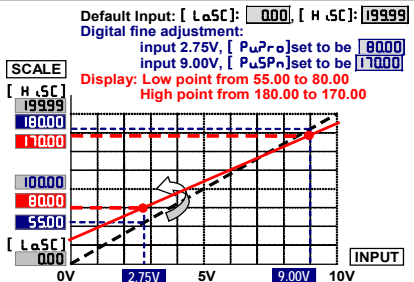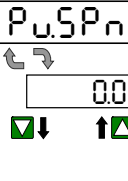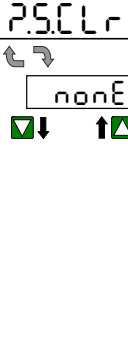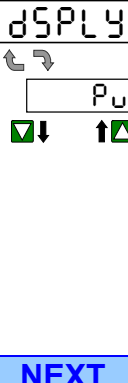## ■ Programming Level
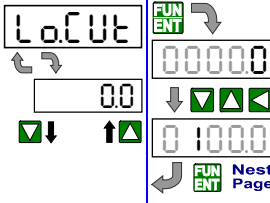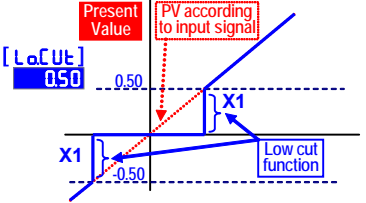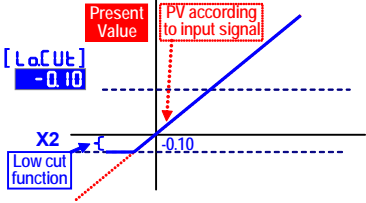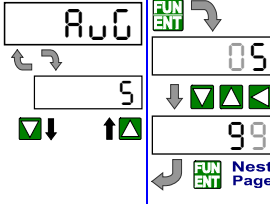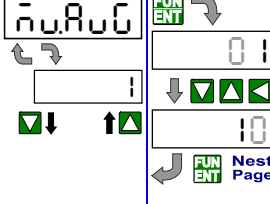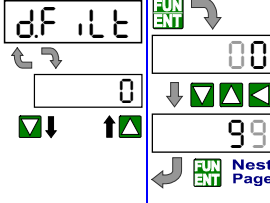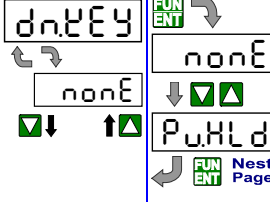
INDEX		FUNCTION DESCRIPTION		PARAMETERS & SETTING	SET
`16888` FUN/ENT ⬇		**MEASURING PAGE**			
`EntEr` `P.CodE` **Default:1000**	FUN/ENT↴ `0000` ⬇▼▲◀ `1000` FUN/ENT Nest Page	**Enter the pass code to access Programming Level**		**If user wants to change the pass code, please go to step A-13 to set. Please remind the new pass code.**	
NO ◇ Pass Code ⬇ YES		**Enter the pass code to access programming level.**			
		Press ◀ for 1 second to back Measuring Page			

`GroUP` `inPUt`	▼→ ←▲	`GroUP` `rELAY`	▼→ ←▲	`GroUP` `Ao`	▼→ ←▲	`GroUP` `rS485`
INPUT GROUP		**RELAY GROUP**		**ANALOGUE OUTPUT GROUP**		**RS485 GROUP**
PRESS FUN/ENT **TO ACCESS**		**PRESS** FUN/ENT **TO ACCESS**		**PRESS** FUN/ENT **TO ACCESS**		**PRESS** FUN/ENT **TO ACCESS**
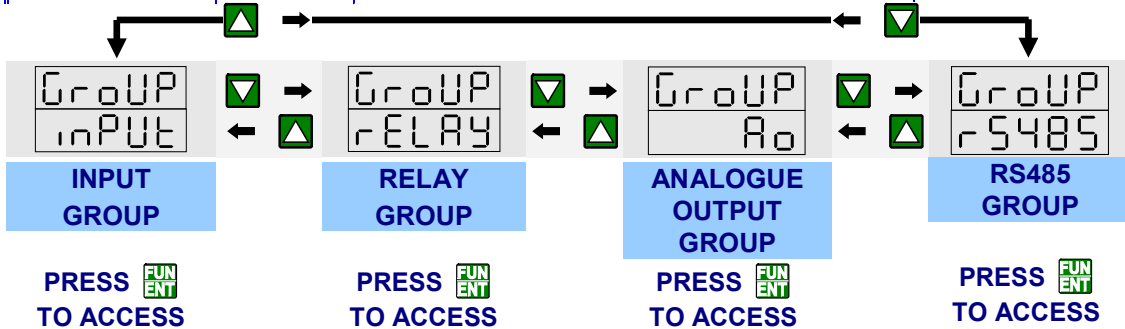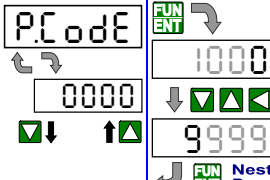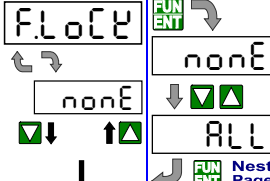
■ Input Group

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
`inPUt` `GroUP` FUN/ENT ⬇		**INPUT GROUP INDEX PAGE**	**In following pages, press ◀ for 1 second to back INPUT GROUP INDEX PAGE.**	
A-0	`A i.tYP` ↴ `A.4-20` ⬇▼ ⬆▲	FUN/ENT↴ `A.4-20` ⬇▼▲ `u.0-10` FUN/ENT Nest Page	**The function is only for CS1-PR** `A i.tYP`(Ai.tyP): Analog input type & range selection There are 3 terminals for mA and V input, if user selects ordering code in input for "AV" from input. Please confirm the wiring is correct or not to set.	**Programmable:** `u.0-10`(0~10V) / `u.0-5`(0~5V) / `u.1-5`(1~5V) / `A.0-10`(0~10mA) / `A.0-20`(0~20mA) / `A.4-20`(4~20mA) ▲Up ▼Down FUN/ENT Enter	
A-1	`Pu.dP` ↴ `0` ⬇▼ ⬆▲	FUN/ENT↴ `0` ⬇▼▲ `0.0000` FUN/ENT Nest Page	`Pu.dP`(Pv.dP): Decimal Point of PV	**Programmable:** `0` / `0.0` / `0.00` / `0.000` / `0.0000` ▲Up ▼Down FUN/ENT Enter	
NEXT	**PAGE**			

A-2	`Lo.SC` / `0000.0` / `0.0` / `000.00`	`FUN ENT` / `0000.0` / `000.00` Nest Page	**Lo.SC (Lo.SC): Low scale of PV** ◘ CS1-SG/PM/RS: If the field calibration has be done and then the [C.SEL] (Calibration parameter selection) selected to be FiELd (field calibration), the [Lo.SC] will be replaced by [CAL.LS], and it can not to be set.	**Programmable: -19999~29999** ◄Shift ▲Up ▼Down ENTEnter SCALE Default: [Lo.SC]: 000, [Hi.SC]: 10000 Change to [Lo.SC]: 5000, [Hi.SC]: 19999	
A-3	`Hi.SC` / `1999.9` / `1999.9` / `2000.0`	`FUN ENT` / `1999.9` / `2000.0` Nest Page	**Hi.SC (Hi.SC): high scale of PV** ◘ CS1-SG/PM/RS: If the field calibration has be done and then the [C.SEL] (Calibration parameter selection) selected to be FiELd (field calibration), the [Hi.SC] will be replaced by [CAL.HS],, and it can not to be set.	**Settable range: -19999~29999** ◄Shift ▲Up ▼Down ENTEnter	
A-4	`Pv.Zro` / `0.0` / `0.0` / `0.0`	`FUN ENT` / `0.0` / `0.0` Nest Page	**Pv.Zro (Pv.Zro): Fine Adjustment low point for PV 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 [Pv.Zro] & [Pv.SPn] are not only in zero & span of PV, but also any lower point for [Pv.Zro] & higher point for [Pv.SPn]. The meter wills be linear for full scale.	**Settable range: -19999~+29999** ◄Shift ▲Up ▼Down ENTEnter Default Input: [Lo.SC]: 000, [Hi.SC]: 19999 Digital fine adjustment: input 2.75V, [Pv.Zro] set to be 8000 input 9.00V, [Pv.SPn] set to be 17000 Display: Low point from 55.00 to 80.00 High point from 180.00 to 170.00	
A-5	`Pv.SPn` / `0.0` / `0.0` / `2000.0`	`FUN ENT` / `0.0` / `2000.0` Nest Page	**Pv.SPn (Pv.SPn): Fine Adjustment high point for PV display;** It's same function as like as [Pv.Zro].	**Settable range: -19999~+29999** ◄Shift ▲Up ▼Down ENTEnter	
A-6	`Z.S.CLr` / `nonE` / `nonE` / `botH`	`FUN ENT` / `nonE` / `botH` Nest Page	**Z.S.CLr (Z.S.CLr): Clear Fine Adjustment of Low / High points for PV display;**	**Programmable:** `nonE` **(None):** Do not clear the fine adjustment of Low / High. `Pv.Zro` **(PV.Zro):** To clear the fine adjustment Low. `Pv.SPn` **(PV.SPn):** To clear the fine adjustment High `botH` **(Both):** To clear the fine adjustment of Low and High. ▲Up ▼Down ENTEnter	
A-7	`dSPLY` / `Pv` / `Pv` / `MAX.Hd`	`FUN ENT` / `Pv` / `MAX.Hd` Nest Page	**dSPLY (dSPLY): Display Function for PV screen** 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, analogue output and down key functions are correspondent to control analogue output, relay energized and so on.	**Programmable:** `Pv` **(PV):** shows PV `Min.Hd` **(Min.Hd):** Minimum Hold of PV `MAX.Hd` **(MAX.Hd):** Maximum Hold of PV `rS485` **(RS485):** Remote displayed from RS485 command of master. ▲Up ▼Down ENTEnter	
NEXT	**PAGE**				

A-8	LoCUt / 0.0	FUN ENT / 0000.0 ↓▽△◁ / 0100.0 / FUN ENT Nest Page	**LoCUt (Lo.CUt): Low Cut the PV** 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 I, the display 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, the display will be X2(Setting value).	**Settable range: -19999~+29999** ◁**Shift** △**Up** ▽**Down** FUN ENT**Enter** **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.**	
A-9	AuG / 5	FUN ENT / 05 ↓▽△◁ / 99 / FUN ENT Nest Page	**AuG (AvG): Average update for PV** 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** FUN ENT**Enter**	
A-10	n̄u.AuG / 1	FUN ENT / 01 ↓▽△◁ / 10 / FUN ENT Nest Page	**n̄u.AuG (M.AvG): Moving Average update for PV** The meter's sampling is 15cycle/sec. If the [n̄u.AuG](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.	**Settable range:** **0(no function)/1~10 times;** ◁**Shift** △**Up** ▽**Down** FUN ENT**Enter**	
A-11	dF iLt / 0	FUN ENT / 00 ↓▽△◁ / 99 / FUN ENT Nest Page	**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** FUN ENT**Enter**	
A-12	dn.kEY / nonE	FUN ENT / nonE ↓▽△ / Pu.HLd / FUN ENT Nest Page	**dn.kEY (dn.key): Down key function** Users can set the ▽down key of front panel to be the functions as like as Relative PV(Tare) / PV Hold / Reset for max(mini) hold / Reset for relay energized latch.	**Programmable:** nonE **(None):** no fuction rEL.Pu **(rEl.Pv):** Relactive PV Pu.HLd **(Pv.HLd):** PV hold n̄.rSt **(M.rST):** Reset for Max./Mini hold rY.rSt **(rY.rST):** Reset for Relay energized latch △**Up** ▽**Down** FUN ENT**Enter**	
	NEXT	**PAGE**			

A-13	P.CodE 0000	**P.CodE (P.CodE): Pass Code setting for access to programming level** Please remind and write down the new pass code so that access to programming level.	**Settable range: 0000~9999** ◀Shift △Up ▽Down Enter	
A-14	F.LoCk nonE	**F.LoCk (F.LoCk): Function level 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` FUN ENT ↓		**RELAY GROUP INDEX PAGE**	In following pages, press ◁ for 1 second to return the RELAY GROUP INDEX PAGE.	
B-1 `rY.Sb` `0.0`	FUN ENT `000.0` ▽△◁ `999.9` FUN ENT Nest Page	**rY.Sb (rY.Sb): Start band of Relay energized** Start Delay　　　　Fig.2	Settable range: 0~9999 digits ◁Shift △Up ▽Down FUN ENT Enter	
B-2 `rY.Sd` `0.00.0`	FUN ENT `000.0` ▽△◁ `9.59.9` FUN ENT Nest Page	**rY.Sd (rY.Sd): start delay time for Relay energized**	Settable range: 0:00.0~9(M):59.9(S) ◁Shift △Up ▽Down FUN ENT Enter	
B-3 `rY1.Md` `Hi`	FUN ENT `Hi` ▽△ `Hi.HLd` FUN ENT Nest Page	**rY1.Md (rY1.Md): Relay 1 energized mode** Hi / Lo Relay Energized Relay Energized Latch & Reset	Programmable: `oFF`(Off): Turn off the Relay and indication LED. `Lo`(Lo): Low Level Energized; Relay will energize when PV < Set-Point. `Hi`(Hi): High Level Energized; Relay will energize when PV > Set-Point. `Hi.HLd`(Hi.HLd)/`Lo.HLd`(Lo.HLd): 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**], or down key function has be set to `rY.rSt` and be pressed. △Up ▽Down FUN ENT Enter	
B-4 `rY1.HY` `0.0`	FUN ENT `000.0` ▽△◁ `500.0` FUN ENT Nest Page	**rY1.HY (rY1.HY): Relay 1 Hysteresis** Energized / De-energized Delay & Hysteresis　Fig.3	Settable range: 0~5000 digits ◁Shift △Up ▽Down FUN ENT Enter	
B-5 `rY1.rd` `0.00.0`	FUN ENT `000.0` ▽△◁ `9.59.9` FUN ENT Nest Page	**rY1.rd (rY1.rd): Relay 1 energized delay time**	Settable range: 0:00.0~9(M):59.9(S) ◁Shift △Up ▽Down FUN ENT Enter	
B-6 `rY1.Fd` `0.00.0`	FUN ENT `000.0` ▽△◁ `9.59.9` FUN ENT Nest Page	**rY1.Fd (rY1.Fd): Relay 1 de-energized delay time**	Settable range: 0:00.0~9(M):59.9(S) ◁Shift △Up ▽Down FUN ENT Enter	

■ Analogue Output Gruop (The group will not be displayed except the AO function is to be specified)

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
Ao GroUP FUN ENT ↓		**AO GROUP INDEX PAGE**	In following pages, press ◄ for 1 second to return the AO GROUP INDEX PAGE.	
D-1 **Ao.tYP** ↻ ↻ A.4-20 ▼↓ ↑▲	FUN ENT ↻ A.4-20 ↓▼▲ u.0-10 ↳ FUN ENT / Nest Page	**Ao.tYP (Ao.tYP): Analogue Output type and range selection;** 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:** A.0-10 (0~10mA) / A.0-20 (0~20mA) / A.4-20 (4~20mA) ▲Up ▼Down FUN ENT Enter	
D-2 **Ao.LS** ↻ ↻ 0.0 ▼↓ ↑▲	FUN ENT ↻ 0000.0 ↓▼▲◄ 500.0 ↳ FUN ENT / Nest Page	**Ao.LS (Ao.LS): the Low point is relative to Analogue Output low;** To set the lower display value versus low output range (as like as 4mA in A.4-20) Ex. Output range set to be A.4-20 (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 FUN ENT Enter	
D-3 **Ao.HS** ↻ ↻ 1999.9 ▼↓ ↑▲	FUN ENT ↻ 1999.9 ↓▼▲◄ 1500.0 ↳ FUN ENT / Nest Page will be changed according to H.SC set.	**Ao.HS (Ao.HS): the High point is relative to Analogue Output high;** To set the higher display value versus high output range (as like as 20mA in A.4-20) Ex. Output range set to be A.4-20 (4~20mA) is relative to display 0~199.99. User can set the [Ao.HS] (Ao.HS) to be 150.00. At meantime, the output signal will be 20mA when the present value(PV) is 150.00.	**Settable range: -19999~29999** ◄Shift ▲Up ▼Down FUN ENT Enter	
D-4 **Ao.Zro** ↻ ↻ 0 ▼↓ ↑▲	FUN ENT ↻ 00000 ↓▼▲◄ 17233 ↳ FUN ENT / Nest Page	**Ao.Zro (Ao.Zro): Fine Zero Adjustment for Analog Low 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 FUN ENT Enter	
D-5 **Ao.SPn** ↻ ↻ 0 ▼↓ ↑▲	FUN ENT ↻ 00000 ↓▼▲◄ 32767 ↳ FUN ENT / Nest Page	**Ao.SPn (Ao.SPn): Fine Span Adjustment for Analog high Output;** Users can get Fine span Adjustment for analogue output by front key of the meter as like as [Ao.Zro] (Ao.Zro).	**Settable range: -38011~27524** ◄Shift ▲Up ▼Down FUN ENT Enter	
D-6 **Z.S.CLr** ↻ ↻ nonE ▼↓ ↑▲	FUN ENT ↻ nonE ↓▼▲ botH ↳ FUN ENT / Nest Page	**Z.S.CLr (Z.S.CLr): Clear the Fine Zero / Span Adjustment for Analog Output**	**Programmable:** nonE (None): Do not clear Ao.Zro (Ao.Zro): Clear low adjust Ao.SPn (Ao.SPn): Clear high adjust botH (both): Clear low & high adjust ▲Up ▼Down FUN ENT Enter	
NEXT	**PAGE**			

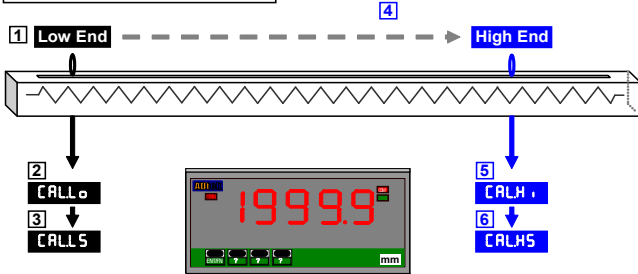| Index	Display	Function Description	Parameters & Setting
D-7	**AoLñt** / 110.00 / 100.00	**AoLñt (Ao.LMt): Analog Output High Limit** Set Scaling: [LoSC]: 0.00, [HiSC]: 19999; Output: [AoLS]: 5000 (Display value Low), [AoHS]: 15000 (Display value High); [AoLñt]: 80.00 %(of Output Range)	Settable range: 0.00~ 110.00% of FS ◁Shift △Up ▽Down **FUN ENT** Enter

■ RS485 Group (The group will be hidden, if the RS485 function is not to be specify)

INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
rS485 GroUP		**RS485 GROUP INDEX PAGE**	In following pages, press ◁ for 1 second to return the RS485 GROUP INDEX PAGE.	
E-1 **AdrES** / 1	001 / 255	**AdrES (Address): Device number of the meter.**	Settable range: 1~255 ◁Shift △Up ▽Down **FUN ENT** Enter	
E-2 **bAUd** / 9600	9600 / 38400	**bAUd (bAUd): Baud rate**	Programmable: 1200 / 2400 / 4800 / 9600 / 19200 / 38400 △Up ▽Down **FUN ENT** Enter	
E-3 **Prity** / n.Stb2	n.Stb2 / EuEn	**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 EuEn (Even): Even △Up ▽Down **FUN ENT** Enter	

■ Field Calibration Group [CS1-SG / CS1-PM / CS1-RS only]

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

Please according to the numbers to do the field calibration (①⇨②⇨③⇨④⇨⑤⇨⑥)
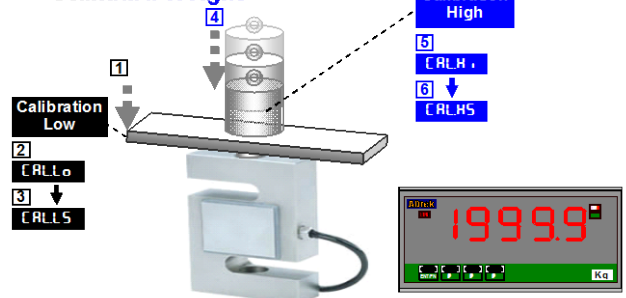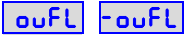
INDEX		FUNCTION DESCRIPTION	PARAMETERS & SETTING	SET
1688.8		**Measuring Page**		
EntEr / P.CodE		**Pass Code Page**		
NEXT	PAGE			

EntEr ↵ **F.CodE**	**FUN/ENT** ↳ **0000** ↓ ▼▲◄ **2000** ↵ **FUN/ENT** Nest Page	**Pass Code Page 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.

NO ← ◇ **Pass Code** **FUN/ENT** ↓ **YES**

		Adjust the structure of machinery to be a lower signal output status(or any lower status).	
F-1 **CAL.Lo** ↵ **0022H** ▼↓ ↑▲	**FUN/ENT** ↳ **052EH** ↵ **FUN/ENT** Nest Page	**CAL.Lo (CAL.Lo): Field Calibration Low**. 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 [CAL.LS].
F-2 **CAL.LS** ↵ **0.0** ▼↓ ↑▲	**FUN/ENT** ↳ **00000** ↓ ▼▲◄ **00000** ↵ **FUN/ENT** Nest Page	**CAL.LS (CAL.LS): the value to be set is relative to Field Calibration low point.**	**Settable range: -19999~29999** ◄**Shift** ▲**Up** ▼**Down** **FUN/ENT Enter**
		Adjust the machinery structure to the higher signal output status(or any higher status).	
F-3 **CAL.Hi** ↵ **6478H** ▼↓ ↑▲	**FUN/ENT** ↳ **699bH** ↵ **FUN/ENT** Nest Page	**CAL.Hi (CAL.Hi): Field Calibration High**. 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 higher point, and go to [CAL.HS].
F-4 **CAL.HS** ↵ **2500.0** ▼↓ ↑▲	**FUN/ENT** ↳ **2500.0** ↓ ▼▲◄ **2500.0** ↵ **FUN/ENT** Nest Page	**CAL.HS (CAL.HS): the value to be set is relative to Field Calibration high point.**	**Settable range: -19999~29999** ◄**Shift** ▲**Up** ▼**Down** **FUN/ENT Enter**
F-5 **C.SEL** ↵ **dEFLt** ▼↓ ↑▲	**FUN/ENT** ↳ **dEFLt** ↓ ▼▲ **F.iELd** ↵ **FUN/ENT** Nest Page	**C.SEL (C.SEL): Calibration parameter selection;** 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.iELd (field):** field calibration points and factors ▲**Up** ▼**Down** **FUN/ENT Enter** ▣ If the user select field calibration of the [Lo.SC](step A-2) and [Hi.SC](step A-3) will be replaced by the [CAL.LS] and [CAL.HS] 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 [CAL.LS] (step F-2) and [CAL.HS](step F-4). ▣ Please double check the [Lo.SC](step A-2) and [Hi.SC](step A-3) whether are correct after selection the **dEFLt** or **F.iELd**.
		Go back to Measuring Page	

■ TROUBLE SHOOTING

Display Issue:

PROBLEM	CHECKING LIST	REMEDY
Display shows `ouFL` `-ouFL`	1.Check if the input signal type (V/A/mA..) of meter is matching with signal in field or not.	Please change another meter that is matching in field. ►For CS1-PR, input range can be programmed in same type(mA or V). Please check the `[A iトYP] (A-00)` in `[ inPUt GroUP]`.
	2.Check if the input signal is over +120% of input high limit or -120% of input low limit.	Please change another meter that is matching in field.
	3.Check if the wirings are 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.
Incorrection display value or out of accuracy	1.Check if the input signal type (V/A/mA..) or range of meter is matching with signal in field or not.	Please change another meter that is matching in field.
	2.Check if the settings of high and low scale are correct or not.	Please check the `[H iSC](A-03)` and `[LoSC](A-02)` in `[ inPUt GroUP]`.
	3.Check if the high and low fine adjustments for PV are changed or not.	Please check the `[PuSPn](A-05)` and `[PuPro](A-04)` in `[ inPUt GroUP]`. The values can be clear in `[P.SCLr](A-06)`.
	CS1-PR: 4.Check if the input signal range of meter is matching with signal in field or not.	Please check the `[A iトYP](A-00)` that has to match the signal in field.
	CS1-SG/CS1-PM 5.Check if the field calibration is matching with sensor in field or not.	Please check the `[CALLS](F-02)` and `[CAL.HS](F-04)` that has to match the measuring range of sensor.
Jittery Display	1.Check if the input signal is jittery.	A.If the input signal is jittery continuously, please set higher value in `[ AuG](A-09)` or `[ṁuAuG](A-10)` B.If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in `[dF iLト](A-11)` 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. Check if the input signal is stable.	A.If the input signal is jittery continuously, please set higher value in `[ AuG](A-09)` or `[ṁuAuG](A-10)` B.If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in `[dF iLト](A-11)` C.Please connects a isolation transformer as close as meter in power lines.
Display shows `- - - - -`	Check display function `[dSPLY]`. It's maybe to be set to `rS485`	Please check the `[dSPLY](A-07)` in `[ inPUt GroUP]` and change the function set from `rS485` to `Pu`.
display value dosen't change	1.Check display function `[dSPLY]`. It's maybe to be set to `ṁA´Hd`(maxmum hold) or `ṁ inHd`(minimum hold)	Please check the `[dSPLY](A-07)` in `[ inPUt GroUP]` and hange the function set from `ṁA´Hd` or `ṁ inHd` to `Pu`.
	2.Check the LED of front key function is bright or not. It's maybe to be set to `PuHLd`, and has been doing the function.	A.Please presses the down key again to reset the function. B.Please check the `[dnkEY](A-12)` in `[ inPUt GroUP]` and change the function set from `PuHLd` to `Pu`.

Relay Output Issue:

PROBLEM	CHECKING LIST	REMEDY
The perameters of Relay dosen't shown	Check if the label of meter for detail specification.	**A.** Please check the product number and output(O/P:_____) description again to confirm the relay output is specify or not. **B.** Please send back to our sales window, or order another product with relay function.
Relay cans not action.	**The relay energized LED doesn't bright**	
	1. Check the energized mode	Please check the [r Y Ind](B-03) in [rELAY GroUP]
	2. Check the delay time and delay band of start delay function.	Please check the [rYSb](B-01) is too wide and [rYSd](B-02) is too long in [rELAY GroUP] or not.
	3. Check the energized delay time	Please check the [rY Ird](B-05) is too long in [rELAY GroUP] or not.
	The relay energized 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
Incorrection analogue output value or out of accuracy	**1.** Check if the output signal type (V/A/mA..) or range of meter is matching with signal in field or not.	**A.** Please check the product number and output(O/P:_____) description again to confirm the analogue output is specify or not. If it does not specify, please send back to our sales window, or order another product with analogue function. **B.** Please confirm the output type is correct and check the range in [AotYP](D-01) of [Ao GroUP]
	2. Check the Analogue output highand low setting.	**A.** Please check the [AoLS](D-02) and [AoHS](D-03) in [Ao GroUP].
Jittery Analogue Output	**Analogue output is according to the display**	
	1. Check if the display is jittery	**A.** If the input signal is jittery continuously, please set higher value in [AuG](A-09) or [InuAuG](A-10) **B.** If the input signal is jittery uncertain period that caused by the inductive load actions, please set higher value in [dF iLt](A-11) **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. 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 the meter 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 LED of RS485 dosen't bright.	**A.** Please check the [AdrES](E-01)、[bAUd](E-02) and [Pr itY](E-03) in [rS485 GroUP] have to match the Host. **B.** Please check the wiring A(+) and B(-) are corrent. **C.** If user uses a converter (RS485/RS232 or RS485/USB..), please check the setting and wiring of converter is correct. **D.** Please check the protocol of host is Modbus RTU Mode
Reply wrong data from the meter	**1.** Check if the 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 LED of RS485 dose bright, but reply Error.	A. Please check the address table of RS485 to make sure that is right address. 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.
Display shows `-----`	In the case, the `[dSPLY]`**(A-07)** has been set to be `r5485` , and the master can not sent the data to the meter.	A. Check the communication software of master. B. Please check the wiring is correct.

■ 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. Writing Command by 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	00H	00H	02H	08H	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	00H	00H	02H	08H	0BH

■ ADDRESS TABLE **Address number are Hexadecimal

■ User level

Name	Address	Range	Explain	Initial	Write/Read	Note
Pu	0000h	-19999~29999	Present Value		R	
Pu.Hd	0001h	-19999~29999	PV Hold		R	
ᄀin	0002h	-19999~29999	The Minimum of PV		R	
ᄀA�45	0003h	-19999~29999	The Maximum of PV		R	
SYSTEM STATUS	0004h		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	
ᄀrSt	0005h	0~1	Reset Maximum & Minimum Value **0:**No **1:**Yes	0	R/W	
rS485	0006h	-19999~29999	PV showing from RS485 command(data)	0	R/W	

■ Programming Level

[Input Group]

Name	Address	Range	Explain	Initial	Write/Read	Note
RESERVED			**No use unless CS1-PR**			
A i.tYP	0007h	0~5	**The address is for CS1-PR only** Analogue Input Type **0:** 0~10V **1:** 0~5V **2:** 1~5V **3:** 0~20mA **4:**4~20mA **5:**0~10mA	4	R/W	
Pu.dP	0008h	0~4	PV Decimal Point **0:** 00000 **1:** 0000.0 **2:** 000.00 **3:** 00.000 **4:** 0.0000	0	R/W	
Lo.SC	0009h	-19999~29999	Low Scale	0	R/W	
H i.SC	000Ah	-19999~29999	High Scale	19999	R/W	
Pu.Pro	000Bh	-19999~29999	PV ZERO	0	R/W	
Pu.SPn	000Ch	-19999~29999	PV SPAN	0	R/W	
P.S.r5t	000Dh	0~3	The clear of PV_ZERO and PV_SPAN **0:** None **1:** PV_ZERO **2:** PV_SPAN **3:** Both	0	R/W	
dSPLY	000Eh	0~3	Display Mode **0:**PV **1:** Minimum Hold **2:** Maximum Hold **3:** RS485	0	R/W	
Lo.CUt	000Fh	-19999~19999	Low Cut	0	R/W	
AuG	0010h	1~99	Average	5	R/W	
d.F i.Lt	0011h	0~99	Digital Filter	0	R/W	
P.CodE	0012h	0000~9999	Pass Code	1000	R/W	
F.LoCY	0013h	0~3	Function Lock **0:** none **1:** User Level **2:** Engineer Level **3:** All	0	R/W	

[RS485 Group]

Name	Address	Range	Explain	Initial	Write/Read	Note
AdrES	0014h	1~255	RS485 address	1	R/W	
bAUd	0015h	0~5	RS485 baud rate **0:**1200 **1:**2400 **2:**4800 **3:**9600 **4:**19200 **5:**38400	3	R/W	
Pr i.tY	0016h	0~3	RS485 parity **0:** n-8-1 **1:** n-8-2, **2:** odd, **3:** even,	1	R/W	

CS1 SERIES–OPERATION MANUAL(EN)-2013-01-04

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