5 DIGITAL MICRO-PROCESS METER with 2~4 ALARMS / ANALOG OUTPUT / RS-485

AM5H-A

FEATURES

- Accuracy: ±0.1% F.S. ±1 digit (DC / Potentiometer / Resistor / PT-100 / Load Cell)
  ±0.2% F.S. ±1 digit (AC)
- Measuring AC, DC Voltage /AC, DC Current / Potentiometer / Resistor / PT-100 / Load Cell)
- High brightness 0.8" LED display range: -19999~99999; decimal point selectable
- Display range programmable
- Max. Hold / Data Hold / Reset / 2~4 Alarms (Hi or Lo) programmable /Analog output (15 bit resolution) / RS-485 communication optional (The above options can exist together)
- High stability, non-flammable case (PC), high safety
- CE approval

CE

ORDER INFORMATION: AM5H -A - Code 1 Code 2 - Code 3 - Code 4 Code 5 Code 6

Code 1	Input Type
D	DC
A	AC AVG
M	AC TRMS
P	3 Wire Potentiometer
I	2 Wire Resistor
T	RTD (PT-100)
L	Load Cell
2	2, 3 Wire Sensor
4	4 Wire Sensor

Code 2	Voltage	Code 2	Current	Code 2	Potentiometer	Code 2	Resistor	Code 2	RTD (PT-100)	Code 2	Load Cell
V1	0~50mV	A1	0~20uA	P1	500Ω~10KΩ	I1	0~10Ω	T1	-50~50℃	L1	1mV/V EX.5V
V2	0~5V	A2	0~200uA	P2	10KΩ~100KΩ	I2	0~100Ω	T2	-100~100℃	L2	2mV/V EX.5V
V3	1~5V	A3	0~2mA	P3	100KΩ~1MΩ	I3	0~1KΩ	T3	-200~200℃	L3	3mV/V EX.5V
V4	0~10V	A4	0~20mA	PO	Option	I4	0~10KΩ	T4	0~600℃	L4	1mV/V EX.10V
V5	0~36V	A5	0~200mA			I5	0~100KΩ	TO	Option	L5	2mV/V EX.10V
V6	0~300V	A6	4~20mA			IO	Option			L6	3mV/V EX.10V
V7	0~600V	A7	0~2A							LO	Option
VO	Option	A8	0~5A								
		A9	0~10A								
		AO	Option								

Code 3	Aux. Power
A	AC/DC100~240V
B	DC 12V
C	DC 24V
D	DC 30~90V

Code 4	Alarm Output
N	None
R2	2 Relays
R3	3 Relays
R4	4 Relays
O2	2 Open Collect
O3	3 Open Collect
O4	4 Open Collect

Code 5	Analog Output
N	None
A	4~20mA
V	0~10V
O	Option

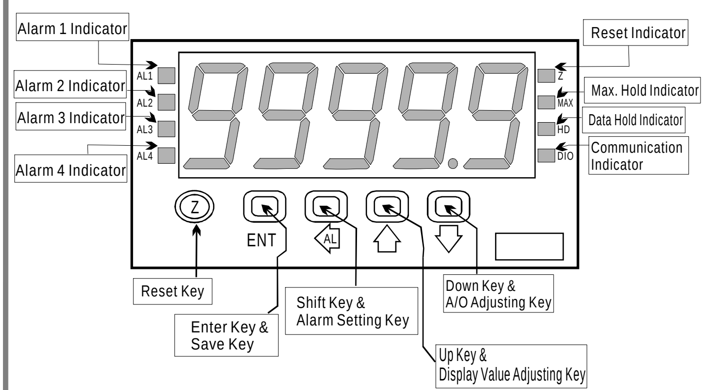
Code 6	RS-485
N	None
Y	Yes

**1: 2 wire type offers excitation power DC24V for 2 wire (Loop Power) pressure, temperature, ,humidity sensors using.
2: Please specify the input signal and display value, inquiry salespersons for special type.
3: Load Cell type of excitation power DC5V can have 2 load cell in parallel; DC10V only can offer 1 load cell to use.
4: 3 Relay type only offers A(NornalOpen) output. O.C. (Open Collect) offers NPN of C.E . output.

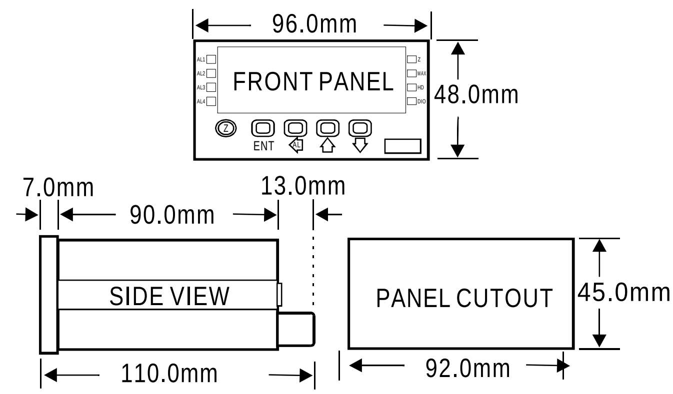
SPECIFICATION

- Accuracy: ±0.1% F.S. ±1 digit (DC / Potentiometer / Resistor / PT-100 / Load Cell)
  ±0.2% F.S. ±1 digit (AC)
- Display Screen: High brightness red LED; 20.3mm(0.8")
- Sampling Time: 16 cycles / sec
- Display Range: -19999~99999
- Zero Adjustment: -19999~99999
- Over Range Indication: doFL / ioFL or -doFL / -ioFL
- Polarity Indication: Automatic with "-" indication
- Parameters Setting: Push buttons
- Back Up Memory: EEPROM
- Alarm Action: "≧(Hi) on" or "< (Lo) on"
- Alarm Run Delay Time: 0~99 sec
- Relay Contact: AC 277V / 7A; DC 30V / 7A
- Analog Output Resolution: 15 bit
- Output Response Time: <250 msec (0~90%)
- Output Capability: Voltage Output: <20mA
  Current Output: <10V
- Communication: RS-485 Modbus RTU mode
- Baud Rate: 38400 / 19200 / 9600 / 4800 bps
- Temperature Coefficient: 100ppm / ℃ (0~60℃)
- Operating Temperature: 0~60℃
- Operating Humidity: 20~90% RH (non-condensing)
- Storage Temperature: -10~70℃
- Storage Humidity: 20~90% RH (non-condensing)
- Power Supply: AC/DC 100~240V; DC 12 / 24 / 30~90V
- Power Consumption: 8.5VA (all functions output)
- Surge Test: 1.5KVac / 1min (Input / Power)
- Input Impendence: Voltage: >2V for 20KΩ / V; ≦2V for >200MΩ
  Current: ≧0.2A at 100mV; <0.2A at 1V

FRONT PANEL & KEY FUNCTIONS



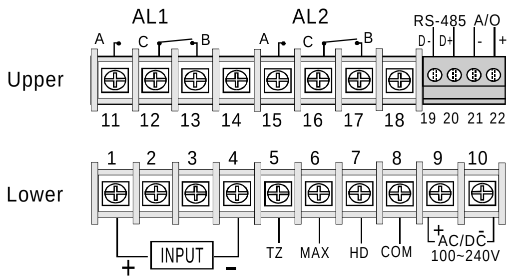
DIMENSION



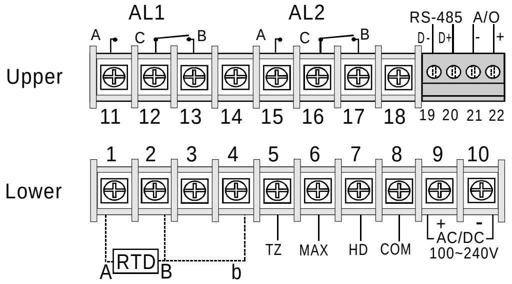
■ WIRING CONNECTION

2 Alarms Output:

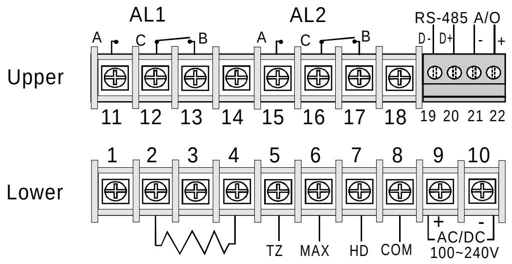
● Voltage, Current (AC, DC)



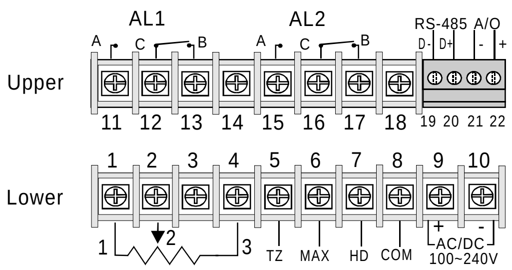
● Temperature (RTD)



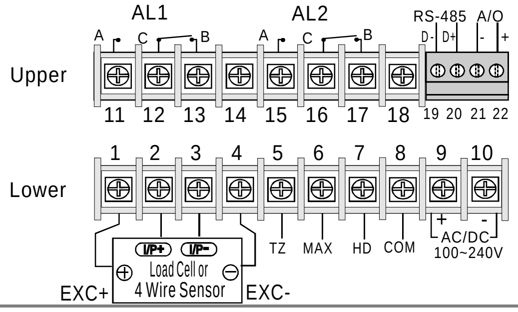
● 2 Wire Resistor



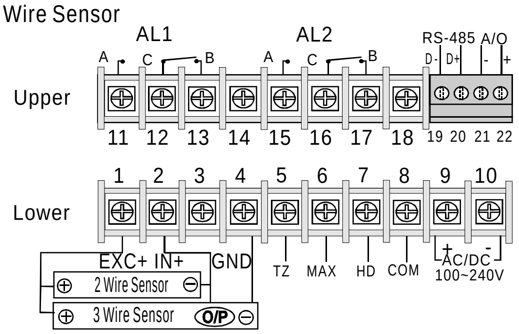
● 3 Wire Petentiometer



● 4 Wire Sensor or Load cell

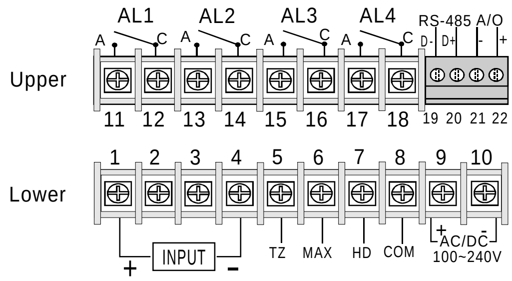


● 2,3 Wire Sensor

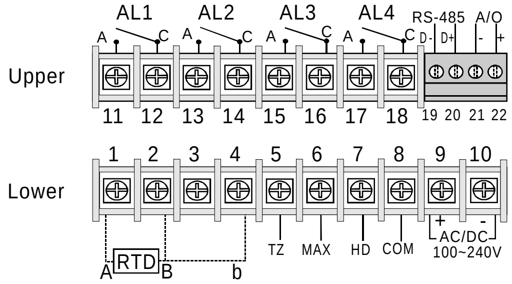


4 Alarms Output:

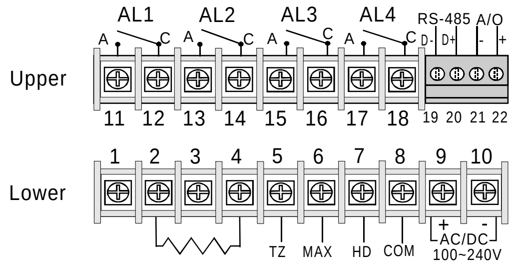
● Voltage, Current (AC, DC)



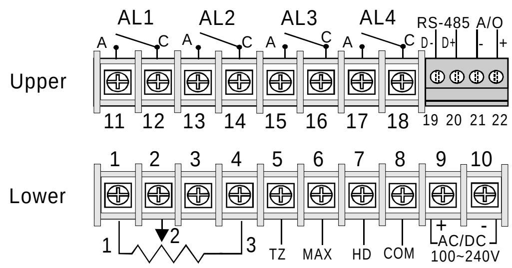
● Temperature (RTD)



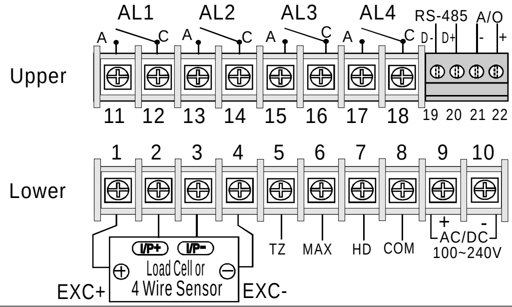
● 2 Wire Resistor



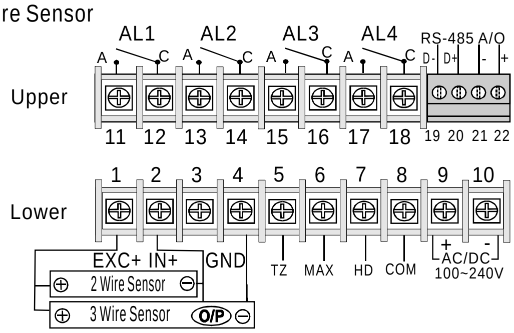
● 3 Wire Petentiometer



● 4 Wire Sensor or Load cell



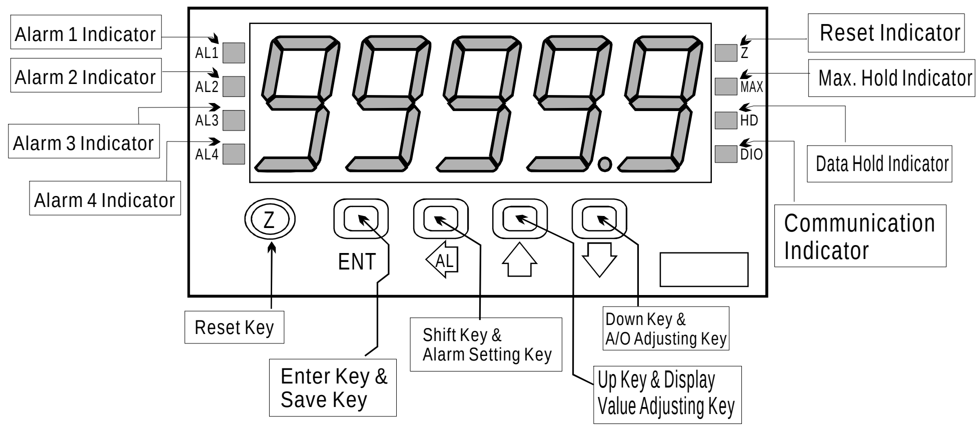
● 2,3 Wire Sensor



AM5H-A 5 DIGITAL MICRO-PROCESS METER with 2~4 ALARMS / ANALOG OUTPUT / RS-485 MANUAL

✱ Please understand key indicators & functions at the first operation.

FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
Reset Key	Ⓩ	1. Press this key to enable the reset function & reset indicator (Z) is light; press this key again to disable the reset function & reset indicator (Z) is dark.
Enter Key & Save Key	ENT	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter.
Shift Key & Alarm Setting Key	⇦AL	1. In the measuring status, press this key for 3 sec can enter to alarm setting page (The selecting digit will be flashed) 2. In the parameter setting , press this key can move the cursor left.
Up Key & Display Value Adjusting Key	⇧	1.In the measuring status, press this key for 3 sec can enter to display value adjustment of "ZERO" & "SPAN" 2. In the parameter setting, press this key can increase the digits.
Down Key & A/O Adjusting Key	⇩	1. In the measuring status, press this key for 3 sec can enter to analog output adjustment. 2. In the parameter setting , press this key can decrease the digits.

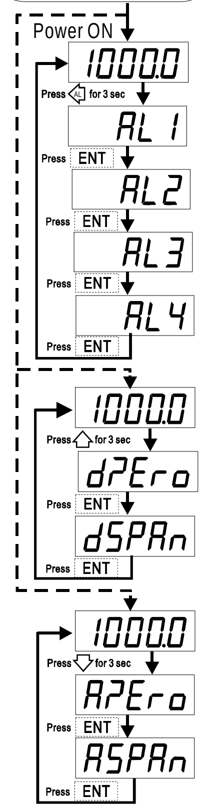
**1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.

2. To modify the parameters, please press ⇦⇧⇩ , and press **ENT** to save the parameter after the modification.

3. Please don't forget the new pass code after modification.

4. In any pages, press ⇧ & ⇩, or don't press any keys for 2 minutes that will back to measuring status.

GENERAL MODE OPERATING PROCEDURES



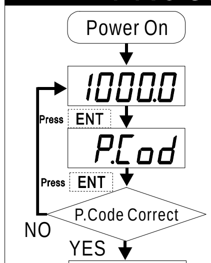
Display	Descriptions	Default
	Alarm Setpoint	
Measuring Status	Present value for measurement	
Alarm 1 Setpoint (AL1)	Press ⇦⇧⇩ to modify alarm 1 setpoint.	00000
Alarm 2 Setpoint (AL2)	Press ⇦⇧⇩ to modify alarm 2 setpoint.	00000
Alarm 3 Setpoint (AL3)	Press ⇦⇧⇩ to modify alarm 3 setpoint.	00000
Alarm 4 Setpoint (AL4)	Press ⇦⇧⇩ to modify alarm 4 setpoint.	00000
	Display: "ZERO" & "SPAN" Adjustment	
Measuring Status	Present value for measurement.	
Display Zero Adjustment (dZEro)	Press ⇦ to select adjusting speed rate, press ⇧ ⇩ to modify the zero value. PS: To use this function to adjust the real zero value.	00000
Display Span Adjustment (dSPAn)	Press ⇦ to select adjusting speed rate, press ⇧ ⇩ to modify the span value. PS: To use this function to adjust the real span value.	00000
	Analog Output: "ZERO" &"SPAN" Adjustment	
Measuring Status	**The following steps are only available for analog output.**	
A/O Zero Adjustment (AZEro)	Press ⇦ to select adjusting speed rate, press ⇧ ⇩ to modify the A/O zero. PS: To use this function to adjust the real A/O zero.	00000
A/O Span Adjustment (ASPAn)	Press ⇦ to select adjusting speed rate, press ⇧ ⇩ to modify the A/O span. PS: To use this function to adjust the real A/O span.	00000

Remark: 1. There are 4 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "Analog Output Setting Group (AoP)" & "RS485 Setting Group(doP)" for modification.

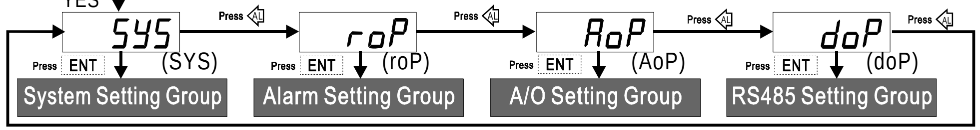
2. Press ⇦AL to select each group page, and press **ENT** to enter each group or parameter page for modification or saving the parameters.

3. Some of optional functions of parameter pages still exist, but the functions are disable.

PROGRAMMING MODE OPERATING PROCEDURES



Display	Descriptions	Default
	Parameter Group Setting Procedures	
Measuring Status	Present value for measurement	
Pass Code (P.Cod)	Press ⇦⇧⇩ to enter pass code.	00000
	Pass code is correct that will enter to parameter groups. Pass code is wrong that will back to measuring status.	



	Display	Descriptions	Default
SYS Press ENT	System Setting Page (SYS)	**System Setting Group Procedures**	
dP Press ENT	Decimal Point Setting (dP)	Press ⇧⇩ to select decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
dSPL Press ENT	Display Low Scale Setting (dSPL)	Press ⇦⇧⇩ to modify display low scale for the input signal zero value. EX: If the input signal is 4~20mA; 4mA is shown display 0.00, this parameter must be set for 000.00.	Customers specify
dSPH Press ENT	Display Hi Scale Setting (dSPH)	Press ⇦⇧⇩ to modify display high scale for the input signal span value. EX: If the input signal is 4~20mA; 20mA is shown display 100.00, this parameter must be set for 100.00.	Customers specify
AvG Press ENT	Display Average Setting (AvG)	Press ⇦⇧⇩ to modify display average (1~99). PS: Please use this function for stable display value when input signal is unstable.	00005
LCUt Press ENT	Display Low Cut Setting (LCUt)	Press ⇦⇧⇩ to modify display low cut to 0 (0~99).	00000
CodE Press ENT	Pass Code Setting (CodE)	Press ⇦⇧⇩ to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
di Press ENT	Control DI Setting (di)	Press ⇧⇩ to select control DI off(YES) or on(NO). PS: Control DI (Z, MAX, HD) & (COM) shorts, the functions starts.	no
LoCK Press ENT	Key Lock Setting (LoCK)	Press ⇧⇩ to lock the keys, using key lock function only can view the parameters, but cannot modify any values. PS: no (unlock) ,YES ("ENT" unlock , others lock).	no
		Alarm Setting Group Procedures	
roP Press ENT	Alarm Setting Page (roP)	**The following steps are only available for alarm output.**	
ACt1 ACt2 ACt3 ACt4 Press ENT	Alarm Action Setting: Alarm 1 (ACt1), Alarm 2 (ACt2), Alarm 3 (ACt3), Alarm 4 (ACt4)	Press ⇧⇩ to modify alarm value that is ≧(Hi) or <(Lo) for alarm action. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press **ENT** to save the value and go to the next parameter.	Hi
HYS1 HYS2 HYS3 HYS4 Press ENT	Alarm Hysteresis Setting: Hysteresis 1 (HYS1), Hysteresis 2 (HYS2), Hysteresis 3 (HYS3), Hysteresis 4 (HYS4)	Press ⇦⇧⇩ to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint ± this range (0~999) will turn off the alarm. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press **ENT** to save the value and go to the next parameter.	00000
dEL1 dEL2 dEL3 dEL4 Press ENT	Alarm Run Delay Setting: Delay Time 1 (dEL1), Delay Time 2 (dEL2), Delay Time 3 (dEL3), Delay Time 4 (dEL4)	Press ⇦⇧⇩ to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press **ENT** to save the value and go to the next parameter.	00000
Sb Press ENT	Alarm Start Band Setting (Sb)	Press ⇦⇧⇩ to modify the value (-99~+99), if the display value don't over this range; the alarm will not be act.	00000
Sdt Press ENT	Alarm Start Band Time Setting (Sdt)	Press ⇦⇧⇩ to modify the value (0~99 sec), if the display value reach alarm start band value; the alarm will be act after this value (sec).(The function is used with "Sb" function.)	00000

	Display	Descriptions	Default
		A/O Setting Group Procedures	
AoP Press ENT	A/O Setting Page (AoP)	**The following steps are only available for analog output.**	
PoLAr Press ENT	A/O Polarity Setting (PoLAr)	Press ⇧⇩ to select output for positive or negative pole. PS : Voltage output ,NO: positive pole output (0~+10V) YES: positive & negative pole output (-10~+10V)	no
AnLo Press ENT	A/O Low Scale Setting (AnLo)	Press ⇦⇧⇩ to adjust A/O low scale to correspond to the display value (programmable). EX : A/O is 0~10V, the display is 10.0 to output 0V, this value must be set for 10.0.	00000
AnHi Press ENT	A/O Hi Scale Setting (AnHi)	Press ⇦⇧⇩ to adjust A/O hi scale to correspond to the display value (programmable). EX : A/O is 0~10V, the display is 90.0 to output1 0V, this value must be set for 90.0.	99999
		RS485 Setting Group Procedures	
doP Press ENT	RS485 Setting Page (doP)	**The following steps are only available for RS-485.**	
Addr Press ENT	Address Setting (Addr)	Press ⇦⇧⇩ to modify address (0~255).	00000
bAUd Press ENT	Baud Rate Setting (bAUd)	Press ⇧⇩ to select baud rate (38400/19200/9600/4800).	19200
PAri Press ENT	Parity Setting (PAri)	Press ⇧⇩ to select parity (n.8.2/n.8.1/even/odd).	n.8.2
FrAmE Press ENT	Frame Setting (FrAmE)	Press ⇧⇩ to select frame type. (NO:Hi ➛ Lo , YES:Lo ➛ Hi)	no

Error Code of Self-Diagnosis

Display	Descriptions
ioFL	Input signal is over 120% of input range.
-ioFL	Input signal is under -20% of input range.
AdEr	Input signal is over 180% of input range or meter error.
doFL	Input signal is over display range (99999)
-doFL	Input signal is under display range (-19999)
E-00	EEPROM reading/writing suffers the interference (about 1 million times).

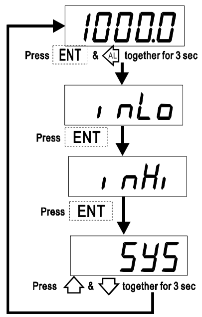
**Please check the wiring connection is correct first, if the problem still exist, please return the meter to the factory.

Modbus RTU Mode Protocol Address Table

Data: 16Bit / 32Bit, +/- is 8000~7FFF (-32768~32767), 80000000~7FFFFFFF(-2147483648~2147483647)

Modbus	HEX	Name	Descriptions	Act
40001	0000	ID	Model number identification; AM5H-A is "00"	R
40002	0001	STATUS	Current alarm output & external control input status display; range: 0000~00FE (0~254) (0:OFF, 1:ON) (Bit7:AL4, Bit6: AL3, Bit5: AL2, Bit4: AL1, Bit3:HD, Bit2:MAX, Bit1:AZ)	R
40003	0002	FUNC	Parameters setting; range: 0000~00FF (0~255) Bit0~3: ACT1~4 (0:HI, 1:LO), Bit4:CON, Bit5:POLAR	R/W
40004	0003	DP	Decimal point setting; range: 0000~0004 (0~4) 0:10^0, 1:10^{-1}, 2:10^{-2}, 3:10^{-3}, 4:10^{-4}	R/W
40005	0004	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40006	0005	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40007	0006	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40008	0007	LCUT	Display low cut setting; range: 0000~0063 (0~99)	R/W
40009	0008	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40010	0009	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40011	000A	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40012	000B	DEL3	Alarm 3 act delay time setting; range: 0000~0063 (0~99)	R/W
40013	000C	DEL4	Alarm 4 act delay time setting; range: 0000~0063 (0~99)	R/W
40014	000D	SB	Alarm start band setting; range: FF9D~0063 (-99~99)	R/W
40015	000E	SDT	Alarm start delay time setting; range: 0000~0063 (0~99)	R/W
40016	000F	HYS1	Alarm 1 hysteresis setting; range: 0000~270F (0~9999)	R/W
40017	0010	HYS2	Alarm 2 hysteresis setting; range: 0000~270F (0~9999)	R/W
40018	0011	HYS3	Alarm 3 hysteresis setting; range: 0000~270F (0~9999)	R/W
40019	0012	HYS4	Alarm 4 hysteresis setting; range: 0000~270F (0~9999)	R/W
40020	0013	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40021	0014	AZERO	Analog output zero setting; range: D8F1~270F (-9999~9999)	R/W
40022	0015	ASPAN	Analog output span setting; range: D8F1~270F (-9999~9999)	R/W
40023	0016	DSPL	Display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40024	0017		Display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40025	0018	DSPH	Display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40026	0019		Display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40027	001A	AL1	Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40028	001B		Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40029	001C	AL2	Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40030	001D		Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40031	001E	AL3	Alarm 3 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40032	001F		Alarm 3 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40033	0020	AL4	Alarm 4 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40034	0021		Alarm 4 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40035	0022	ANLO	Analog output low scale setting; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R/W
40036	0023		Analog output low scale setting; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R/W
40037	0024	ANHI	Analog output hi scale setting; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R/W
40038	0025		Analog output hi scale setting; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R/W
40039	0026	DISPLAY	Current display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40040	0027		Current display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40041	0028	INLO	Input low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40042	0029		Input low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40043	002A	INHI	Input hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40044	002B		Input hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40045	002C	MAX	Max. hold display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40046	002D		Max. hold display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40047	002E	HOLD	Data hold display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40048	002F		Data hold display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40049	0030	AZ	Auto zero; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40050	0031		Auto zero; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R

CALIBRATION OPERATING PROCEDURES



Display	Descriptions	Default
	Calibration	
Measuring Status	Present value for measurement Press **ENT** & AL together for 3 sec will enter to calibration operating procedures.	
Input Low Scale Calibration (inLo)	1. Input standard low scale signal. 2. Press AL ⇧ ⇩ to calibrate input low scale.	
Input Hi Scale Calibration (inHi)	1. Input standard hi scale signal. 2. Press AL ⇧ ⇩ to calibrate input hi scale.	
System Setting Page(SYS)	1. Finish calibration operating procedures will enter to system setting group. 2. Press ⇧ & ⇩ together to back to measuring status.	

Warning: Calibration of this meter requires a standard signal with 0.01% accuracy or better and an external meter with 0.005% accuracy or better.