5 DIGITAL DUEL INPUT MICRO-PROCESS MATH METER with 2~4 ALARMS / RS-485

AM5H-B

■ FEATURES

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

CE

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

Code 1	Input Type
D	DC
A	AC AVG
M	AC TRMS

Code 2	I/P 1
1	0~50mV
2	0~10V
3	0~300V
4	0~20mA
5	4~20mA
6	0~2A
7	0~5A
O	Option

Code 3	I/P 2
1	0~50mV
2	0~10V
3	0~300V
4	0~20mA
5	4~20mA
6	0~2A
7	0~5A
O	Option

Code 4	Aux. Power
A	AC/DC 100~240V
D	AC/DC 22~60V

Code 5	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

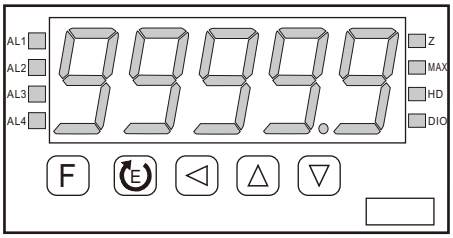
Code 6	RS-485
N	None
Y	Yes

**1:3 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); ±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
- ♦ 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; AC/DC 22~60V
- ♦ 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



F Reset Key

Enter Key & Save Key

Shift Key & Alarm Setting Key

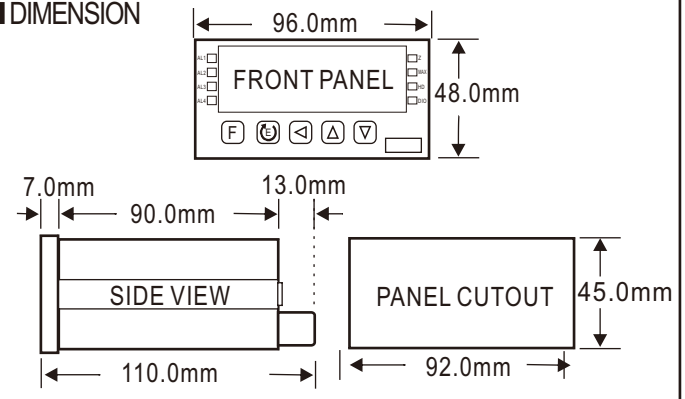
Up Key & Value Adjusting Key

Down Key

Indicators:

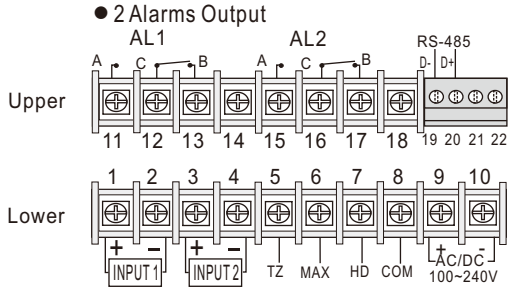
AI1: Alarm 1 Indicator
AI2: Alarm 2 Indicator
AI3: Alarm 3 Indicator
AI4: Alarm 4 Indicator
Z: Reset Indicator
MAX: Max. Holding Indicator
HD: Value Holding Indicator
DIO: Communication Indicator

■ DIMENSION

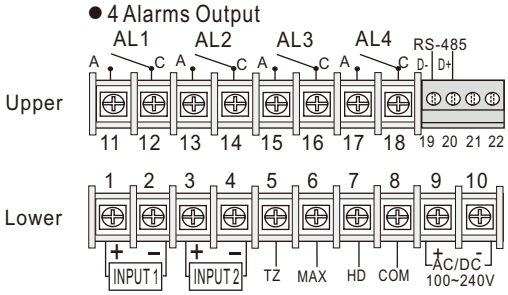


■ WIRING CONNECTION

● 2 Alarms Output



● 4 Alarms Output



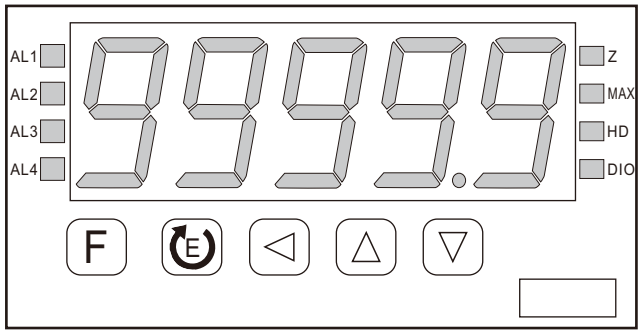
AM5H-B

5 DIGITAL DUEL INPUT MICRO-PROCESS MATH METER with 2~4 ALARMS / RS-485

MANUAL

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

FRONT PANEL & KEY FUNCTIONS



Indicators:

AI1: Alarm 1 Indicator
AI2: Alarm 2 Indicator
AI3: Alarm 3 Indicator
AI4: Alarm 4 Indicator
Z: Reset Indicator
MAX: Max. Holding Indicator
HD: Value Holding Indicator
DIO: Communication Indicator

Key Name	Symbol	Descriptions
Reset Key	F	1. Press this key to enable the reset function & reset indicator(F) is light; press this key again to disable the reset function & reset indicator(F) is dark.
Enter Key & Save Key	E	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	◁	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	▽	1. In the parameter setting , press this key can decrease the digits.

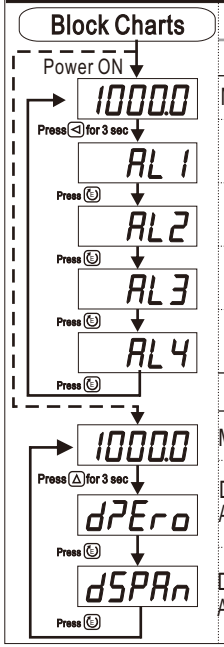
**1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.

2. To modify the parameters, please press ◁/△/▽, and press E 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.

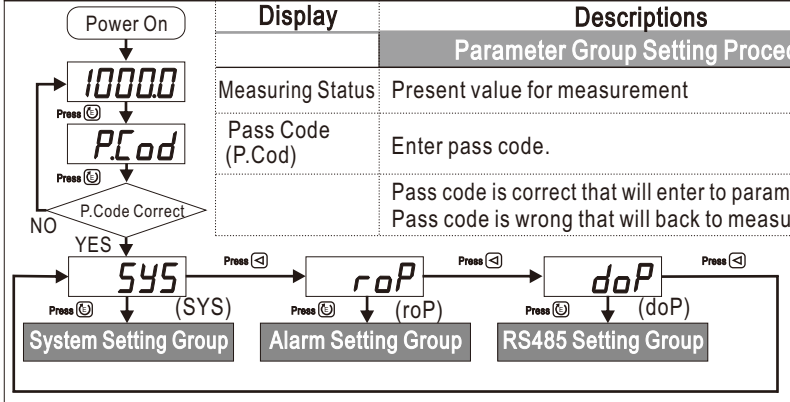
GENERAL MODE OPERATING PROCEDURES



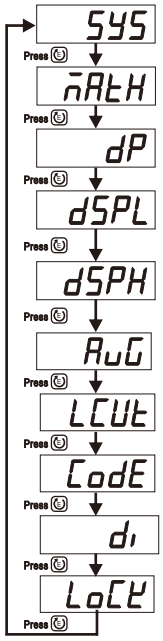
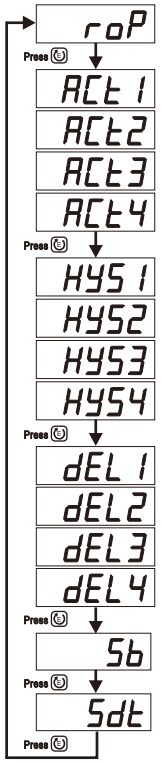
Display	Descriptions	Default
	Alarm Setpoint	
Measuring Status	Present value for measurement	
Alarm 1 Setpoint (AL1)	Modify alarm setpoint.	00000
Alarm 2 Setpoint (AL2)		00000
Alarm 3 Setpoint (AL3)		00000
Alarm 4 Setpoint (AL4)		00000
	Display: "ZERO" & "SPAN" Adjustment	
Measuring Status	Present value for measurement.	
Display Zero Adjustment (dZEro)	Modify the zero value. PS: To use this function to adjust the real zero value.	00000
Display Span Adjustment (dSPAn)	Modify the span value. PS: To use this function to adjust the real span value.	00000

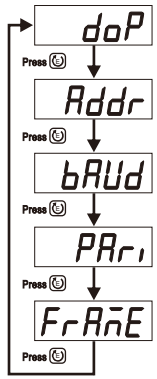
Remark: 1. There are 3 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "RS485 Setting Group(doP)" for modification.
2. Press ◁ to select each group page, and press E to enter each group or parameter page for modification or saving the parameters.
3. Some of optional functions 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)	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
	System Setting Page (SYS)		**System Setting Group Procedures**	
	Math Type Setting (MAtH)		Select the math type (+, -, x, /).	
	Decimal Point Setting (dP)		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
	Display Low Scale Setting (dSPL)		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
	Display Hi Scale Setting (dSPH)		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
	Display Average Setting (AvG)		Modify display average (1~99). PS: Please use this function for stable display value when input signal is unstable.	00005
	Display Low Cut Setting (LCUt)		Modify display low cut to 0 (0~99).	00000
	Pass Code Setting (CodE)		Modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
	Control DI Setting (di)		Select control DI off(YES) or on(NO). PS: Control DI (Z, MAX, HD) & (COM) shorts, the functions starts.	no
	Key Lock Setting (LoCK)		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 Page (roP)		**Alarm Setting Group Procedures** **The following steps are only available for alarm output.**	
	Alarm 1 (ACt1) Alarm 2 (ACt2) Alarm 3 (ACt3) Alarm 4 (ACt4)	Alarm Action Setting	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.	Hi
	Hysteresis 1 (HYS1) Hysteresis 2 (HYS2) Hysteresis 3 (HYS3) Hysteresis 4 (HYS4)	Alarm Hysteresis Setting	Modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint ±this value (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.	00000
	Delay Time 1 (dEL1) Delay Time 2 (dEL2) Delay Time 3 (dEL3) Delay Time 4 (dEL4)	Alarm Run Delay Setting	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.	00000
	Alarm Start Band Setting (Sb)		Modify the value (-99~+99), if the display value don't over this range; the alarm will not be act.	00000
	Alarm Start Band Time Setting (Sdt)		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	RS485 Setting Group Procedures	Default
	RS485 Setting Page (doP)	**The following steps are only available for RS-485.**	
	Address Setting (Addr)	Modify address (0~255).	00000
	Baud Rate Setting (bAUd)	Select baud rate (38400/19200/9600/4800).	19200
	Parity Setting (PAri)	Select parity (n.8.2/n.8.1/even/odd).	n.8.2.
	Frame Setting (FrAmE)	Select frame type. (NO:Hi→Lo , YES:Lo→Hi)	no

Error Code of Self-Diagnosis

Display	Descriptions
i oFL	Input signal is over 120% of input range.
-i oFL	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.

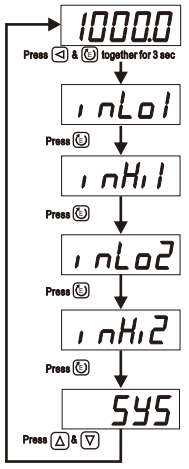
Modbus RTU Mode Protocol Address Table

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

Modbus	HEX	Name	Descriptions	Act
40001	0000	ID	Model number identification; AM5H-B is "05"	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, Bit6:LOCK, Bit7:FRAME (0:NO, 1:YES)	R/W
40004	0003	MATH	Math setting; range: 0000~0003 (0:ADD, 1:SUB, 2:MUL, 3:DIV)	R/W
40005	0004	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
40006	0005	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40007	0006	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40008	0007	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40009	0008	LCUT	Display low cut setting; range: 0000~0063 (0~99)	R/W
40010	0009	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40011	000A	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40012	000B	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40013	000C	DEL3	Alarm 3 act delay time setting; range: 0000~0063 (0~99)	R/W
40014	000D	DEL4	Alarm 4 act delay time setting; range: 0000~0063 (0~99)	R/W
40015	000E	SB	Alarm start band setting; range: FF9D~0063 (-99~99)	R/W
40016	000F	SDT	Alarm start delay time setting; range: 0000~0063 (0~99)	R/W
40017	0010	HYS1	Alarm 1 hysteresis setting; range: 0000~270F (0~9999)	R/W
40018	0011	HYS2	Alarm 2 hysteresis setting; range: 0000~270F (0~9999)	R/W
40019	0012	HYS3	Alarm 3 hysteresis setting; range: 0000~270F (0~9999)	R/W
40020	0013	HYS4	Alarm 4 hysteresis setting; range: 0000~270F (0~9999)	R/W
40021	0014	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40022	0015	DSPL	Display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40023	0016		Display low scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40024	0017	DSPH	Display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40025	0018		Display hi scale setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40026	0019	AL1	Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40027	001A		Alarm 1 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40028	001B	AL2	Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40029	001C		Alarm 2 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40030	001D	AL3	Alarm 3 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40031	001E		Alarm 3 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W
40032	001F	AL4	Alarm 4 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Hi Bit	R/W
40033	0020		Alarm 4 setpoint setting; range: FFFFB1E1~0001869F(-19999~99999) Low Bit	R/W

Modbus	HEX	Name	Descriptions	Act
40034	0021	DISPLAY	Current display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40035	0022		Current display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40036	0023	INLO1	Input 1 low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40037	0024		Input 1 low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40038	0025	INHI1	Input 1 hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40039	0026		Input 1 hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40040	0027	INLO2	Input 2 low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40041	0028		Input 2 low calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40042	0029	INHI2	Input 2 hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Hi Bit	R
40043	002A		Input 2 hi calibrated value display; range: 00029F16~004EA4A8 (171798~5153960) Low Bit	R
40044	002B	MAX	Max. hold display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40045	002C		Max. hold display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40046	002D	HOLD	Data hold display; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40047	002E		Data hold display; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R
40048	002F	AZ	Auto zero; range: FFFFB1E1~0001869F (-19999~99999) Hi Bit	R
40049	0030		Auto zero; range: FFFFB1E1~0001869F (-19999~99999) Low Bit	R

CALIBRATION OPERATING PROCEDURES



Display	Descriptions	Default
	Calibration	
Measuring Status	Present value for measurement calibration operating procedures.	
Input Low Scale 1 Calibration (inLo1)	1. Input standard low scale signal to input 1. 2. Calibrate input low scale.	
Input Hi Scale 1 Calibration (inHi1)	1. Input standard hi scale signal to input 1. 2. Calibrate input hi scale.	
Input Low Scale 2 Calibration (inLo2)	1. Input standard low scale signal to input 2. 2. Calibrate input low scale.	
Input Hi Scale 2 Calibration (inHi2)	1. Input standard hi scale signal to input 2. 2. Calibrate input hi scale.	
System Setting Page(SYS)	1. Finish calibration operating procedures will enter to system setting group. 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.