LARGE DISPLAY
with 1~4 ALARMS / ANALOG OUTPUT / RS-485

GBMA

■ FEATURES

- Accuracy: ±0.1% F.S. ±1 digit (DC / Potentiometer / Resistor / PT-100 / Load Cell)
  ±0.2% F.S. ±1 digit (AC)
- High brightness LED display range: -19999~99999
- Parameters setting by infrared remote control
- Baud rate up to 19200 bps; sampling time up to 60 cycles / sec
- Root square / Analog output simulation function available
- Max. Hold / Data Hold / Reset / 1~4 Alarms (Hi or Lo) programmable / Analog output (15 bit resolution) / RS-485 communication optional (The above options can exist together)
- Invisible wire connection, easily installation

CE

■ ORDER INFORMATION: GBMA- Code 1 - Code 2 Code 3 - Code 4 - Code 5 Code 6 Code 7

Code 1	Digits
3	3 Digits
4	4 Digits
5	5 Digits

Code 2	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 3	Voltage	Code 3	Current	Code 3	Potentiometer	Code 3	Resistor	Code 3	RTD (PT-100)	Code 3	Load Cell
V1	0~50mV	A1	0~20uA	P1	500Ω~10KΩ	I1	0~10Ω	T1	-50~50°C	L1	1mV/V EX.5V
V2	0~5V	A2	0~200uA	P2	10KΩ~100KΩ	I2	0~100Ω	T2	-100~100°C	L2	2mV/V EX.5V
V3	1~5V	A3	0~2mA	P3	100KΩ~1MΩ	I3	0~1KΩ	T3	-200~200°C	L3	3mV/V EX.5V
V4	0~10V	A4	0~20mA	PO	Option	I4	0~10KΩ	T4	0~600°C	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	AO	Option								

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

Code 4	Aux. Power
A	AC/DC100~240V
D	AC/DC22~60V

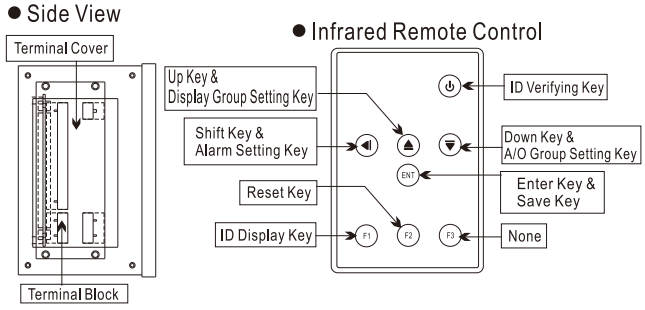
Code 7	RS-485
N	None
Y	Yes

**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.

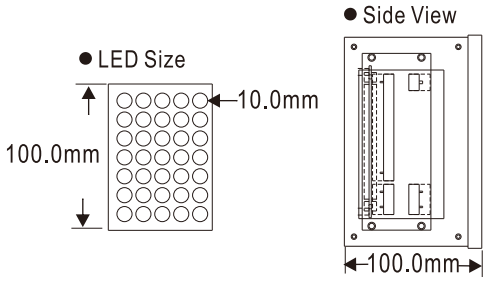
■ SPECIFICATION

♦ 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; 10cm (4")
♦ Sampling Time:	60 cycles / sec
♦ Display Range:	-199999~999999
♦ Zero Adjustment:	-199999~999999
♦ Over Range Indication:	do / io or -do / -io
♦ Polarity Indication:	Automatic with "-" indication
♦ Parameters Setting:	Infrared Remote Control
♦ 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:	19200 / 9600 / 4800 / 2400 bps
♦ Temperature Coefficient:	100ppm / °C (0~60°C)
♦ Operating Temperature:	0~60°C
♦ Operating Humidity:	20~90% RH (non-condensing)
♦ Storage Temperature:	-10~70°C
♦ 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

■ SIDE PANEL & KEY FUNCTIONS

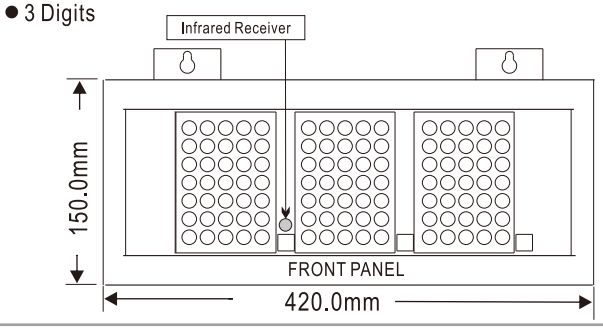


■ SIDE & LED DIMENSION

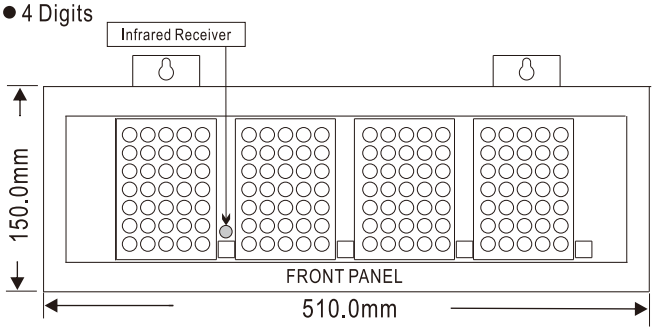


■ DIMENSIONS

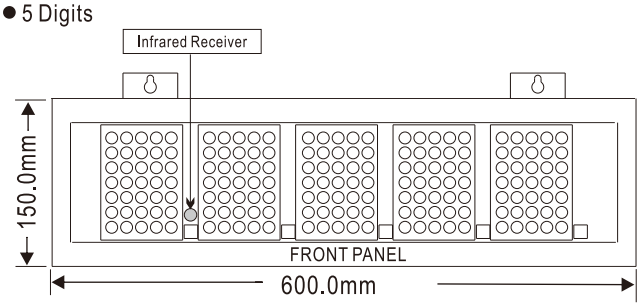
● 3 Digits



● 4 Digits

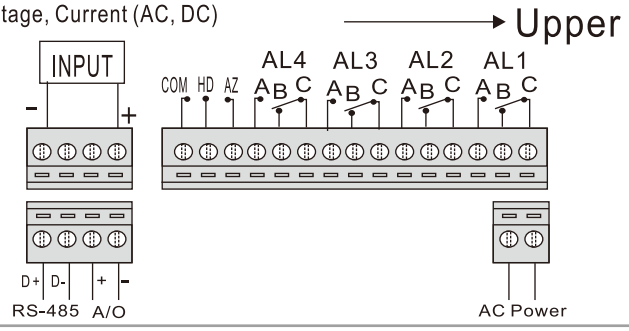


● 5 Digits

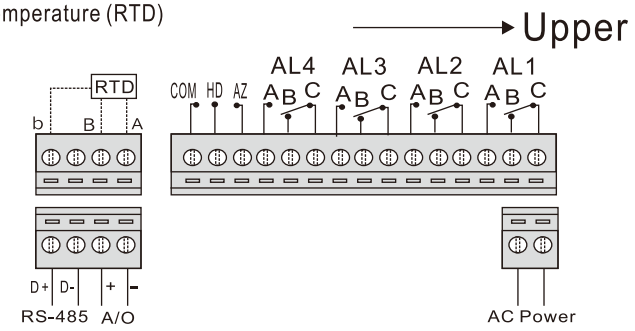


■ WIRING CONNECTION

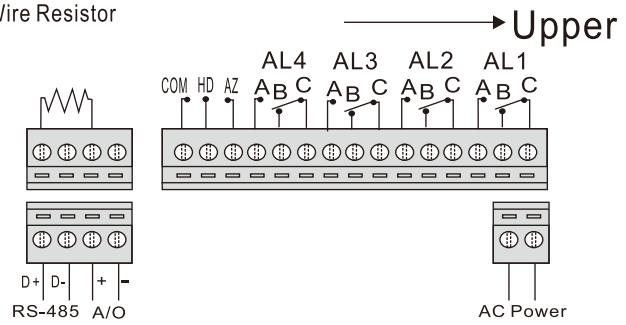
● Voltage, Current (AC, DC)



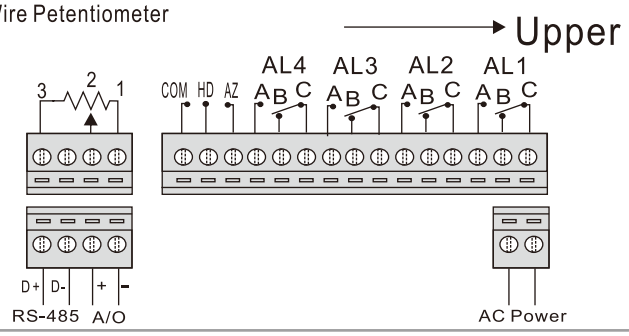
● Temperature (RTD)



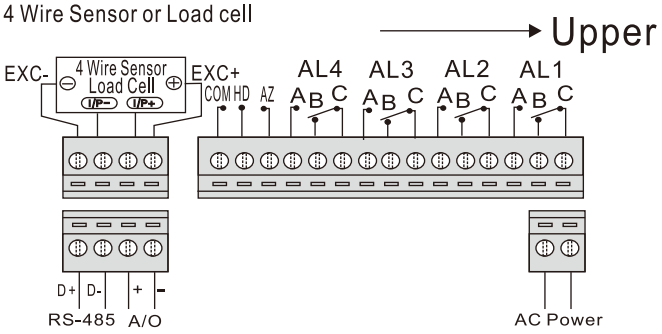
● 2 Wire Resistor



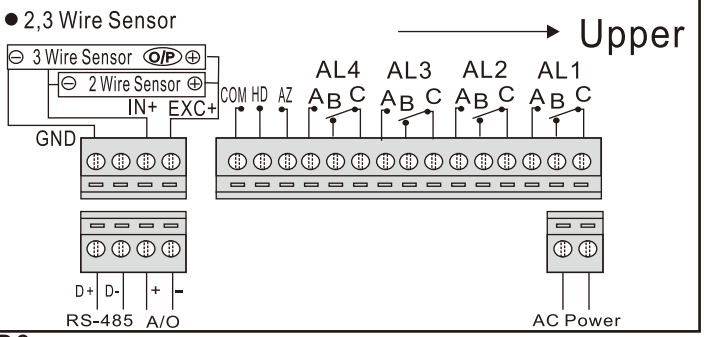
● 3 Wire Petentiometer



● 4 Wire Sensor or Load cell



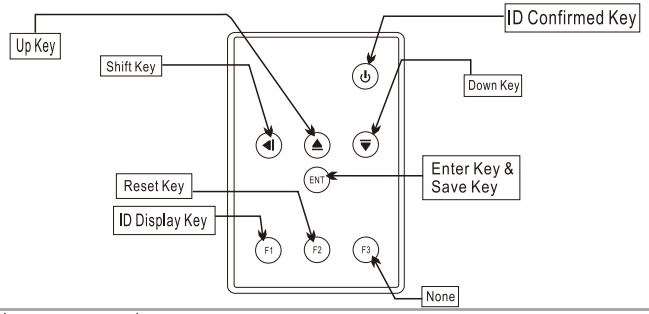
● 2,3 Wire Sensor



GBMA — 4" (10 cm) DOT MATRIX LARGE DISPLAY with 1~4 ALARMS / ANALOG OUTPUT / RS-485 — MANUAL

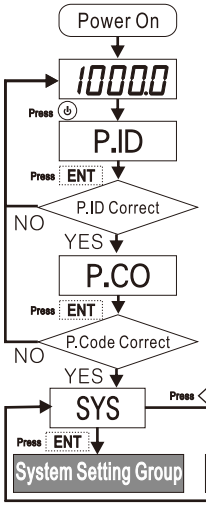
✻ Please understand key indicators & functions at the first operation.

FRONT PANEL & KEY FUNCTIONS

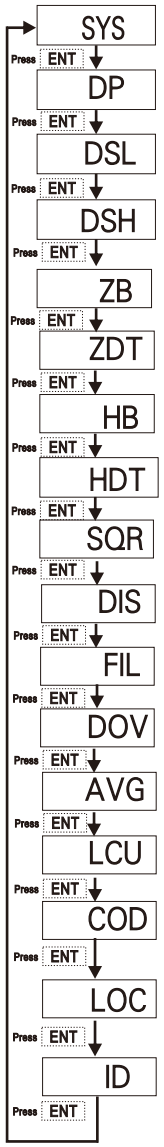


Key Name	Symbol	Descriptions
ID Confirmed Key	⏻	1. In the measuring status, press this key can enter to ID confirmed page. 2. In the parameter setting, press this key can back to the measuring page.
Enter Key & Save Key	ENT	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter.
Shift Key	◀	1. In the parameter setting , press this key can move the cursor left.
Up Key	▲	1. 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.

PROGRAMMING MODE OPERATING PROCEDURES



Display	Descriptions	Default
	Parameter Group Setting Procedures	
Measuring Status	Present value for measurement	
ID Confirmation (P.ID)	Press ◁ △ ▽ to enter ID code.	0000
	ID code is correct that will enter to P.CO page. ID code is wrong that will back to measuring status.	
Pass Code (P.Cod)	Press ◁ △ ▽ to enter pass code.	0000
	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 Group Procedures	
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
Display Low Scale Setting (dSL)	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
Display Hi Scale Setting (dSH)	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
Zero Band Setting (Zb)	Press ◁ △ ▽ to modify zero band setting.	0000
Zero Tracking Time Setting (Zdt)	Press △ ▽ to modify zero tracking time setting (0~99 sec)	0000
Input Holding Band Setting (Hb)	Press ◁ △ ▽ to modify input hold band setting.	0000
Input Holding Time Setting (Hdt)	Press △ ▽ to modify input holding time setting (0~99 sec)	0000
Root Square Setting (Sqr)	Press △ ▽ to select root square setting (NO or YES)	NO
Display Selection Setting (diS)	Press △ ▽ to modify display selection (DIS, MAX, HD) PS: DIS: Current Display; MAX; Max. Hold; HD: Hold Data	DIS
Display Filter Setting (FiL)	Press △ ▽ to modify display filter setting (0, 1, 2, 5).	0000
Display Overvalue Setting (dov)	Press ◁ △ ▽ to modify display overvalue setting (0~9999).	0000
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.	0005
Display Low Cut Setting (LCU)	Press ◁ △ ▽ to modify display low cut to 0 (0~99).	0000
Pass Code Setting (Cod)	Press ◁ △ ▽ to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	0000
Key Lock Setting (LoC)	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
Identification Setting (id)	Press ◁ △ ▽ to modify identification (00~99). PS: If the ID is 00; Meter can received any Infrared Control.	0000

	Display		Descriptions	Default
			Alarm Setting Group Procedures	
ROP	Alarm Setting Page (roP)		**The following steps are only available for alarm output.**	
AL1	Alarm 1 Setpoint (AL1)		Press◁△▽to modify alarm 1 setpoint.	0000
AL2	Alarm 2 Setpoint (AL2)		Press◁△▽ to modify alarm 2 setpoint.	0000
AL3	Alarm 3 Setpoint (AL3)		Press◁△▽ to modify alarm 3 setpoint.	0000
AL4	Alarm 4 Setpoint (AL4)		Press◁△▽ to modify alarm 4 setpoint.	0000
AC1	Alarm 1 (ACt1)	Alarm Action Setting	Press △▽ to modify alarm value that is ≧(Hi) or <(Lo) for alarm action.	HI
AC2	Alarm 2 (ACt2)			
AC3	Alarm 3 (ACt3)		Press △▽ to modify alarm value that is ≧(Hi) or <(Lo) or (Go) for alarm action.	HI
AC4	Alarm 4 (ACt4)		Press △▽ to modify alarm value that is (Hi) or <(Lo) or (Err) for alarm action.	HI
HY1	Hysteresis 1 (HYS1)	Alarm Hysteresis Setting	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.	0000
HY2	Hysteresis 2 (HYS2)			
HY3	Hysteresis 3 (HYS3)			
HY4	Hysteresis 4 (HYS4)			
DE1	Delay Time 1 (dEL1)	Alarm Run Delay Setting	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.	00
DE2	Delay Time 2 (dEL2)			
DE3	Delay Time 3 (dEL3)			
DE4	Delay Time 4 (dEL4)			
SB	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.	00
SDT	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.)	00
			A/O Setting Group Procedures	
AOP	A/O Setting Page (AoP)		**The following steps are only available for analog output.**	
POL	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
ANL	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.	0000
ANH	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.	9999

	Display	Descriptions	Default
		RS485 Setting Group Procedures	
DOP	RS485 Setting Page (doP)	**The following steps are only available for RS-485.**	
ADD	Address Setting (Addr)	Press◁△▽ to modify address (0~255).	0000
BAU	Baud Rate Setting (bAUd)	Press △▽to select baud rate (38400/19200/9600/4800).	384
PAR	Parity Setting (PAri)	Press △▽ to select parity (n.8.2/n.8.1/even/odd).	n.8.2.
FRA	Frame Setting (FrAmE)	Press △▽ to select frame type. (NO:Hi→Lo , YES:Lo→Hi)	NO
		Input / Output Adjustment Procedures	
ADJ			
DOF	Display Offset Setting (doF)	Press◁△▽ to display offset value (-1999~9999).	0000
DGA	Display Gain Setting (dGA)	Press◁△▽ to display gain value (-1999~9999).	0000
AOF	A/O Offset Setting (AoF)	Press◁△▽to analog output offset value (-9999~9999).	0000
AGA	A/O Gain Setting (AGA)	Press◁△▽ to analog output gain value (-9999~9999).	0000

Error Code of Self-Diagnosis

Display	Descriptions
IO	Input signal is over 120% of input range.
-IO	Input signal is under -20% of input range.
DO	Input signal is over 180% of input range or meter error.
-DO	Input signal is over display range (99999)
ADE	Input signal is under display range (-19999)
E00	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 Map

Data Format 16Bit / 32Bit, With Sign 8000~7FFF (-32768~32767),80000000~7FFFFFFF (-2147483648~2147483647)

Modbus	HEX	Name	Descriptions	ACT
40001	0000	ID	Model number identification of GBMA is 2BH	R
40002	0001	STATUS	Current alarm output & external control input status display;Range: 0000~00FE(0~0254) Bit7:WARN,Bit6:AL1,Bit5:AL2,Bit4:AL3,Bit2:MAXRST,Bit1:AZ,Bit0:AZ1(0:HI,1:LO)	R
40003	0002			R/W
40004	0003			
40005	0004	SQRT	Root Function, Range: 0000~0001 (0~1);0: No, 1:YES	R/W
40006	0005	POLAR	A/O Polarity, Range: 0000~0001(0~1)0:NO,1:YES	R/W
40007	0006	FILT	Display Filter, Range: **0000~0003(0~3)0:0 ,1:1, 2:2, 3:5**	R/W
40008	0007	DISP	Display Selection, Range: 0000~0002 (0~2); 0: DIS, 1:MAX ,2:HD	R/W
40009	0008	FRAME	Frame,Range: 0000~0001(0~1)0:NO,1:YES	R/W
40010	0009	LOCK	Key Lock,Range: 0000~0001(0~1)0:NO,1:YES	R/W
40011	000A	ACT1	Alarm 1 Alarm Action,Range: 0000~0001(0~1)0:HI,1:LO	R/W
40012	000B	ACT2	Alarm 2 Alarm Action,Range: 0000~0001(0~1)0:HI,1:LO	R/W
40013	000C	ACT3	Alarm 3 Alarm Action,Range: 0000~0001(0~1)0:HI,1:LO	R/W
40014	000D	ACT4	Alarm 4 Alarm Action,Range: 0000~0001(0~1)0:HI,1:LO	R/W
40015	000E	DP	Decimal Point,Range: 0000~0004(0~4)0:0 dig,1:1 dig ,2:2 dig,3:3 dig,4:4 dig	R/W
40016	000F	BAUD	Baud Rate,Range: 0000~0003(0~3)0:38400,1:19200,2:9600,3:4800	R/W
40017	0010	PARI	Parity,Range: 0000~0003(0~3)0:N.8.2.,1:N.8.1.,2:EVEN,3:ODD	R/W
40018	0011	AVG	Display Average,Range: 0001~0063(1~99)	R/W
40019	0012	DIG	Display Digit,Range: D000~0003(3~5)	R/W
40020	0013	IDNO	ID No.,Range: 0000~0063(0~99)	R/W
40021	0014	ADDR	Address,Range: 0000~00FF(0~255)	R/W
40022	0015	DEL1	Alarm 1 Action Delay,Range: 0000~0063(0~99)	R/W
40023	0016	DEL2	Alarm 2 Action Delay,Range: 0000~0063(0~99)	R/W
40024	0017	DEL3	Alarm 3 Action Delay,Range: 0000~0063(0~99)	R/W
40025	0018	DEL4	Alarm 4 Action Delay,Range: 0000~0063(0~99)	R/W
40026	0019	SB	Alarm Start Band,Range: FF9D~0063(-99~99)	R/W
40027	001A	SDT	Alarm Start Band Time,Range: 0000~0063(0~99)	R/W
40028	001B	ZDT	Zero Tracking Time, Range: 0000~0063 (0~99)	R/W
40029	001C	HDT	Input Holding Time, Range: 0000~0063 (0~99)	R/W
40030	001D	LCUT	Low Cut,Range: 0000~270F(0~9999)	R/W
40031	001E	ZB	Zero Band, Range: 0000~270F(0~9999)	R/W
40032	001F	HB	Input Holding Band, Range: 0000~270F(0~9999)	R/W
40033	0020	HYS1	Alarm1 Hysteresis,Range: 0000~270F(0~9999)	R/W
40034	0021	HYS2	Alarm2 Hysteresis,Range: 0000~270F(0~9999)	R/W
40035	0022	HYS3	Alarm3 Hysteresis,Range: 0000~270F(0~9999)	R/W

Modbus	HEX	Name	Descriptions	ACT
40036	0023	HYS4	Alarm4 Hysteresis,Range: **0000~270F(0~9999)**	R/W
40037	0024	CODE	Pass Code,Range: **0000~4E1F(0~19999)**	R/W
40038	0025	AOFST	A/O Offset, Range: D8F1~270F (-9999~9999)	R/W
40039	0026	AGAIN	A/O Gain, Range: D8F1~270F (-9999~9999)	R/W
40040	0027	AZERO	A/O Offset,Range: **D8F1~270F(-9999~9999)**	R/W
40041	0028	ASPAN	A/O Gain,Range: **D8F1~270F(-9999~9999)**	R/W
40042	0029	ANLO	A/O Low Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40043	002A		A/O Low Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40044	002B	ANHI	A/O Hi Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40045	002C		A/O Hi Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40046	002D	DSPL	Display Low Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40047	002E		Display Low Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40048	002F	DSPH	Display Hi Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40049	0030		Display Hi Scale,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40050	0031	DOFST	Display Offset,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40051	0032		Display Offset,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40052	0033	DGAIN	Display Gain,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40053	0034		Display Gain,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40054	0035	DOFLV.	Display Overvalue,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40055	0036		Display Overvalue,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40056	0037	AL1	Alarm Point**1**,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40057	0038		Alarm Point**1**,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40058	0039	AL2	Alarm Point**2**,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40059	003A		Alarm Point**2**,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40060	003B	AL3	Alarm Point**3**,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40061	003C		Alarm Point**3**,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40062	003D	AL4	Alarm Point4,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40063	003E		Alarm Point4,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R/W
40064	003F	MAX	Display Max Value,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R/W
40065	0040		Display Max Value,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R
40066	0041	HD	Display Holding Value,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R
40067	0042		Display Holding Value,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R
40068	0043	AZ	Display Zero Value,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R
40069	0044		Display Zero Value,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R
40070	0045	RATE	Display Value,Range: **FFFFB1E1~0001869F(-19999~99999)**MSB	R
40071	0046		Display Value,Range: **FFFFB1E1~0001869F(-19999~99999)**LSB	R