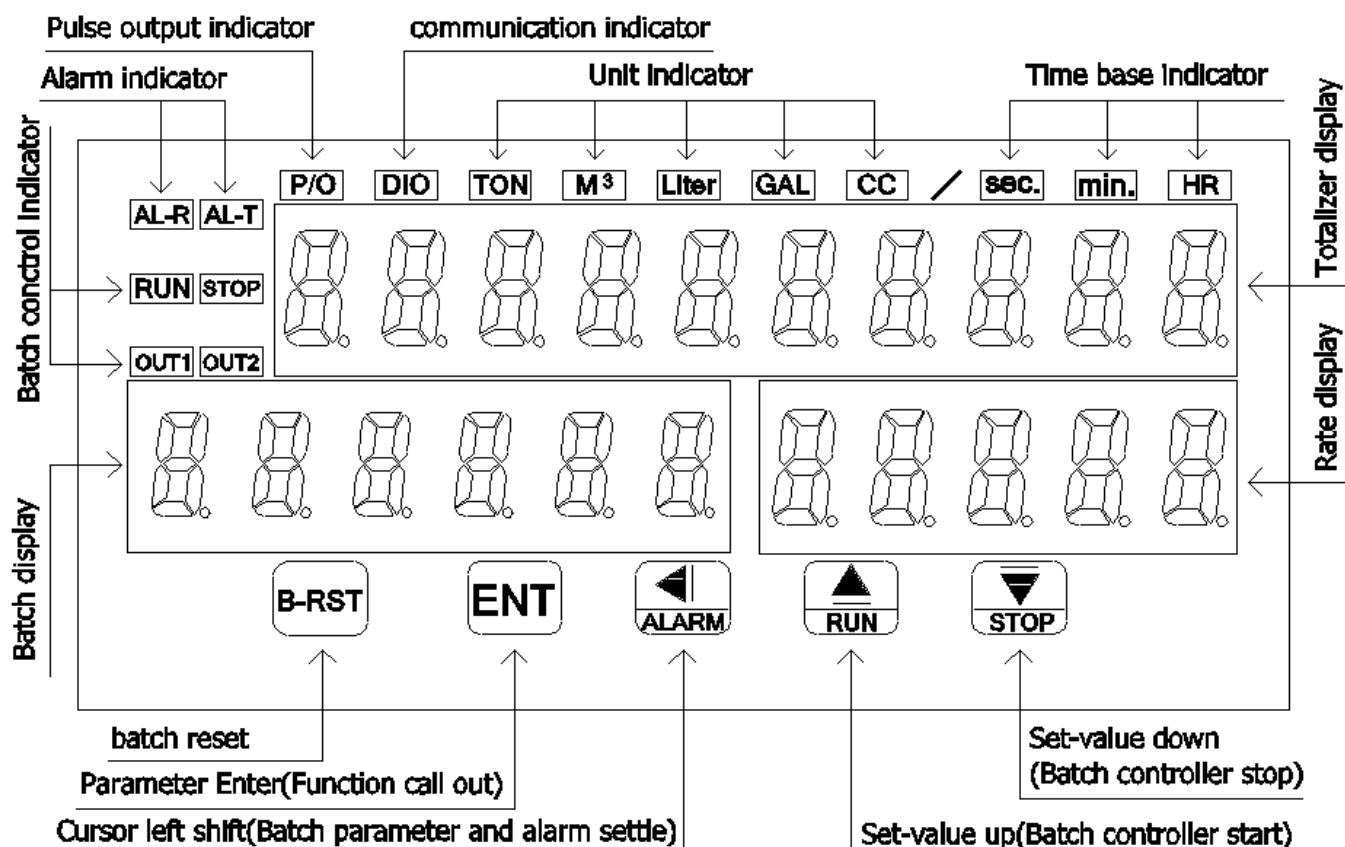


■ FEATURES

◎Accuracy 0.05% FS ± 1 digit	◎Front panel push buttons allow the operate to start/stop/batch reset function
◎Measuring and display rate(5 digits)/batch(6 digits)/totalizer(10 digits)	◎RS485 communication interface,MODBUS RTU MODE
◎Display flow unit TON/M ³ /Liter/GAL/CC can be modified	◎BAUD RATE:38400/19200/9600/4800/2400
◎Programable time base(1 or 60 or 3600 or 86400 second)	◎Man-machine interface,easy to operate
◎Prestop counting function for batch controller	◎EEPROM saving data safekeeping about 10 years
◎Two-counting mode Up/Down for batch controller	◎Protection class NEMA4/IP64

■ Name of Parts

Key Introduce	Operation Manual
① key function	1. In normal display,the key function is call out setting group 2. In normal display,When IN-T = AN(Analog input), Keep ①key press beyond 10 seconds, will be into D-ZERO setting page 3. In parameter setting page,the key function is data ENTER and goto next page
② key function	1. In normal display, Keep ② key press beyond 3 seconds,will be into BATCH setting page 2. In normal display, Keep ② key press beyond 10 seconds,will be into AL-R setting page 3 Into parameter setting page, the parameter mark & data is alternate display,If need modify data can press ② key into setting procedure,The display is lock parameter data,this time must let off key about 0.2 sec ,press again, the cursor (twinkle express)is cycle moving left.(Key response about 0.2 sec.)
③ key function	1. In normal display,Press ③ key to start batch operate 2. Into parameter setting page, the parameter mark & data is alternate display,If need modify data can press ③ key into setting procedure,The display is lock parameter data,this time must let off key about 0.2 sec ,press again, the parameter data will be increment.(Key response about 0.2 sec.)
④ key function	1. In normal display,Press ④ key to stop batch operate 2. Into parameter setting page, the parameter mark & data is alternate display,If need modify data can press ④ key into setting procedure,The display is lock parameter data,this time must let off key about 0.2 sec ,press again, the parameter data will be decrement.(Key response about 0.2 sec.)

▲&▼ key function	1.In setting group or setting page press ▲ & ▼ key return normal display, but if in setting page the modify data will be lost
B-RST key function	1.When B-O-M = N(Manual), Press B-RST key beyond 3 seconds, will be reset batch count
No key in anything	1.In setting group or setting page no key in anything about 30 sec., return normal display

■ Inside parameter operate procedure

Step	Parameter Mark Description	Parameter Mark	Operation Manual
1	Normal display	0 1 2 3 4	1.Press □ key into P.COD setting page
2	P.COD(Pass Code) Default = 0	P - C o d E 0 0 0 0 0	1.Key in 5 digit pass code with ▲&▼ key 2.Press □ key, If the pass code is correct then into setting group, otherwise, return normal display
3	SYS(System Setting Group)	S Y S	1.Select setting group with □ key
	ROP(Alarm output Setting Group)	r o P	2.Press □ key into setting page of selection setting group
	DOP(Communication Setting Group)	d o P	
	AOP(Analog output Setting Group)	A o P	
4	SYS(System setting group)	S Y S	1.Press □ key decide SYS setting group 2.Press □ key into IN-T setting page
4-1	IN-T(Input Type) Default = AN	, n - E A n	1.Decide Input Type with ▲&▼ key(0~3)(AN/PULSE/MAG-P) 2.Press □ key enter data and into D-UNIT setting page
4-2	D-UNIT(Display Flow Unit) Default = TON	d - U n i t t o n	1.Decide Display Flow Unit with ▲&▼ key(TON/M ³ /Liter/GAL/CC) 2.Press □ key enter data and into T-UNIT setting page
4-3	T-UNIT(Time base Unit) Default = MIN	E - U n i t n . n	1.Decide Time base Unit with ▲&▼ key(SEC./MIN./HR/DAY) 2.Press □ key enter data and into DP.R setting page
4-4	DP.R(Rate Decimal Point) Default = 0	d P - r 0 0 0 0 0	1.Decide Rate Decimal Point with ▲&▼ key(0~4) 2.Press □ key enter data and into DP.B setting page
4-5	DP.B(Batch Decimal Point) Default = 0	d P - b 0 0 0 0 0	1.Decide Batch Decimal Point with ▲&▼ key(0~4) 2.Press □ key enter data and into DP.T setting page
4-6	DP.T(Totalizer Decimal Point) Default = 0	d P - t 0 0 0 0 0	1.Decide Total Decimal Point with ▲&▼ key(0~4) 2.If IN-T = AN, Press □ key enter data and into step 4-7 DSPL-R setting page 3.If IN-T = PULSE/MAG-P, Press □ key enter data and into step 4-10 DP-KF setting page
4-7	DSPL-R(Rate Display Low) Default = 0	d S P L - r 0 0 0 0 0	1.Decide Rate Display Low with ▲&▲&▼ key(0~999), If Rate display below settle value will be show zero, as Low Cut function 2.Press □ key enter data and into DSPH-R setting page
4-8	DSPH-R(Rate Display High) Default = 1000	d S P H - r 0 1 0 0 0	1.Decide Rate Display High with ▲&▲&▼ key(0~99999) 2.Press □ key enter data and into SQRT-K setting page
4-9	SQRT-K(Rootextractor Constant-K) Default = 0.5	S Q R t - E 0.5	1.Decide Rootextractor Constant-K with ▲&▼ key(K=0.5/1.5/2.5) 2.Press □ key enter data and into step 4-13 B-I-M setting page
4-10	DP-KF(K-Factor Decimal Point) Default = 0	d P - E F 0 0 0 0 0	1.Decide K-Factor Decimal Point with ▲&▼ key(0~4) 2.Press □ key enter data and into KF setting page
4-11	KF(K-Factor) Default = 100	E F 0 0 1 0 0	1.Decide K-Factor with ▲&▲&▼ key(1~99999) 2.Press □ key enter data and into T-BASE setting page
4-12	T-BASE(Time Base) Default = 1.0 second	E - b A S E 0 0 0 1 0	1.Decide Time Base with ▲&▲&▼ key(0.1~99.9 秒) 2.Press □ key enter data and into B-I-M setting page
4-13	B-I-M(Batch Controller Counting)	b - , - E	1.Decide Batch Controller Counting Mode with ▲&▼ key

	Mode) Default = UP	UP	(UP/DOWN)
4-14	B-O-M(Batch Controller Output Mode) Default = N	b - o - n n	2.Press key enter data and into B-O-M setting page 1.Decide Batch Controller Output Mode with & key (N/A), N = Manual reset, A = Auto restart
4-15	B-AT-T(Batch Controller Auto-Restart Time) Default = 0.1 second	b - AT - T 0000.1	1.Decide Batch Controller Auto-Reset Time with & & key (0.1~99.9 seconds), B-O-M = N will be disable 2.Press key enter data and into T-C-M setting page
4-16	T-C-M(Totalizer Counting Mode) Default = N-SYN	t - C - n n - S Y n	1.Decide Totalizer Counting Mode with & key (SYN (synchronize)/N-SYN(non-synchronize)) 2.Press key enter data and into SCALE setting page
4-17	SCALE(Totalizer Scale) Default = 1.0000	SCALE 1.0000	1.Decide Totalizer Scale with & & key (0.0001~9.9999) 2.Press key enter data and into AVG setting page
4-18	AVG(Average) Default = 5	Avg 00005	1.Decide Average with & & key (1~99) 2.Press key enter data and into CODE-S setting page
4-19	CODE-S(Code Setting) Default = 00000	Code - S 00000	1.Decide Code Setting with & & key (00000~99999) 2.Press key enter data and into LOCK setting page
4-20	LOCK(Panel Lock) Default = 0	LOCK 00000	1.Decide Panel Lock with & key (0~2) 0 = All operate procedure can be modified 1 = Only outside operate procedure can be modified 2 = Only batch operate procedure can be modified 2.Press key enter data and return SYS Setting Group
5	ROP(Alarm Output setting group)	r o P	1.Press key decide ROP setting group 2.Press key into ACT-R setting page
5-1	ACT-R(Rate Active Direction) Default = HI	ACT - r H.	1.Decide Rate Active Direction with & key (HI/LO) 2.Press key enter data and into DEL-R setting page
5-2	DEL-R(Rate Alarm Delay Time) Default = 0	DEL - r 00000	1.Decide Rate Alarm Delay Time with & & key (-99~99) -1~99 = Alarm active time 1~99 = Alarm delay time 2.Press key enter data and into T-O-M setting page
5-3	T-O-M(Totalizer Alarm output Mode) Default = N	t - o - n n	1.Decide Totalizer Alarm output Mode with & key (N/A) N = Manual reset, A = Auto restart 2.Press key enter data and into T-AT-T setting page
5-4	T-AT-T(Totalizer Alarm Auto-restart Time) Default = 0.1 second	t - AT - T 0000.1	1.Decide Totalizer Alarm Auto-restart Time with & & key (0.1~99.9 seconds), T-O-M = N will be disable 2.Press key enter data and into T-RST setting page
5-5	T-RST(Totalizer Manual Reset) Default = NO	t - r S t no	1.Decide Totalizer Manual Reset with & key (YES/NO) T-O-M = A will be disable 2.Press key enter data and into P-UNIT setting page Note: When T-RST is set to YES and T-O-M is set to N, The AL-T RELAY is OFF and Totalizer value is reset
5-6	P-UNIT(Totalizer Pulse Unit) Default = 1	P - U n . t 1	1.Decide Totalizer Pulse Unit with & key (0.001/0.01/0.1/1) 2. Press key enter data and into P-FREQ setting page
5-7	P-FREQ(Pulse Output Frequency) Default = 100	P. F - E 9 100	1.Decide Pulse Output Frequency with & key (1/5/10/25/50/100 Hz) 2. Press key enter data and return ROP Setting Group
6	DOP(Communication setting group)	d o P	1.Press key decide DOP setting group 2.Press key into ADDR setting page
6-1	ADDR(Communication Address) Default = 0	addr 00000	1.Decide Communication Address with & & key (0~255) 2.Press key enter data and into BAUD setting page
6-2	BAUD(Communication Baud Rate) Default = 19200	baud 19200	1.Decide Communication Baud Rate with & key (38400/19200/9600/4800/2400) 2.Press key enter data and into PARI setting page
6-3	PARI(Communication Parity Check)	par.	1.Decide Communication Parity Check with & key

Default = n.8.2.

n.8.2

(n.8.2/n.8.1/even/odd)

2.Press key enter data and return DOP Setting Group

7	AOP(Analog Output setting group) Default = RATE	 	1.Press key decide AOP setting group 2.Press key into AO-SEL setting page 1.Decide Analog Output Select with & key(RATE/TOTAL/BATCH) 2.If AO-SEL = RATE,Press key enter data and into step 7-2 R-ANLO setting page 3.If AO-SEL = TOTAL,Press key enter data and into step 7-4 T-ANLO setting page 4.If AO-SEL = BATCH,Press key enter data and into step 7-6 B-ANLO setting page
7-2	R-ANLO(RATE Analog Output Zero-According to Display) Default = 0	 	1.Decide RATE Analog Output Zero-According to Display with & & key(0~99999) 2.Press key enter data and into R-ANHI setting page
7-3	R-ANHI(RATE Analog Output Span-According to Display) Default = 1000	 	1.Decide RATE Analog Output Span-According to Display with & & key(0~99999) 2.Press key enter data and into step 7-8 A-ZERO setting page
7-4	T-ANLO(Total Analog Output Zero-According to Display) Default = 0	 	1.Decide Total Analog Output Zero-According to Display with & & key(0~999999999) 2.Press key enter data and into T-ANHI setting page
7-5	T-ANHI(Total Analog Output Span-According to Display) Default = 1000	 	1.Decide Total Analog Output Span-According to Display with & & key(0~999999999) 2.Press key enter data and into step 7-8 A-ZERO setting page
7-6	B-ANLO(Batch Analog Output Zero-According to Display) Default = 0	 	1.Decide Batch Analog Output Zero-According to Display with & & key(0~999999) 2.Press key enter data and into B-ANHI setting page
7-7	B-ANHI(Batch Analog Output Span-According to Display) Default = 1000	 	1.Decide Batch Analog Output Span-According to Display with & & key(0~999999) 2.Press key enter data and into step 7-8 A-ZERO setting page
7-8	A-ZERO(Analog Output Zero Adjust) Default = 0	 	1.Decide Analog Output Zero Adjust with & & key (-6000~6000) 2.Press key enter data and into A-SPAN setting page
7-9	A-SPAN(Analog Output Span Adjust) Default = 0	 	1.Decide Analog Output Span Adjust with & & key (-6000~6000) 2.Press key enter data and return AOP Setting Group

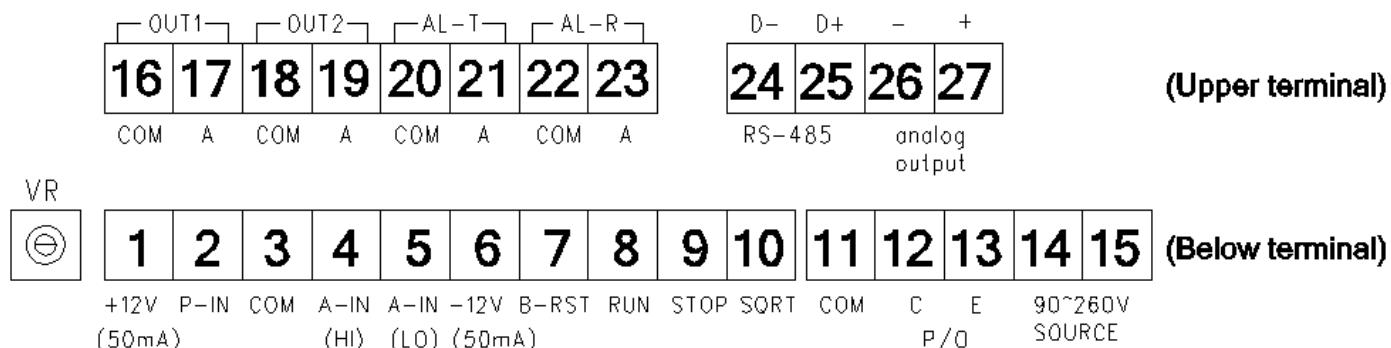
Outside parameter operate procedure

Step	Parameter Mark Description	Parameter Mark	Operation Manual
8	Normal display		1.Press key beyond 3 seconds into BATCH setting page
8-1	BATCH(Batch) Default = 100	 	1.Decide Batch with & & key(0~99999) 2.Press key enter data and into START-D setting page
8-2	START-D(OUT2 Start Delay Time) Default = 1 second	 	1.Decide OUT2 Start Delay Time with & & key(0~99 second) 2.Press key enter data and into PRESTOP setting page
8-3	PRESTOP(OUT2 Prestop Counting) Default = 1	 	1.Decide OUT2 Prestop Counting with & & key (0~9999) 2.Press key enter data and return Normal display
9	Normal display		1.Press key beyond 10 seconds into AL-R setting page
9-1	AL-R(Rate Alarm) Default = 100	 	1.Decide Rate Alarm with & & key(0~99999) 2.Press key enter data and into AL-T setting page
9-2	AL-T(Totalizer Alarm) Default = 10000	 	1.Decide Totalizer Alarm with & & key (0~999999999) 2.Press key enter data and return Normal display

10	Normal display		1. If IN_T = AN, Press key beyond 10 seconds into D-ZERO setting page
10-1	D-ZERO(Display Zero Adjust) Default = 0	 	1. Decide Display Zero Adjust with & key 2. Press key enter data and into D-SPAN setting page
10-2	D-SPAN(Display Span Adjust) Default = 0	 	1. Decide Display Span Adjust with & key 2. Press key enter data and return Normal display

Appendix	Error Mark description	Error Mark	Analyze & Description
1	Display over range error detect		1. Input signal over display range
2	Input over range error detect		1. Input signal over measurable range
3	EEPROM error detect	 	1. External interference when EEPROM read/write 2. EEPROM write over 100,000 cycles(guarantee 10 years) Please power reset, if still display E-00, doing below step: a. E-00 & No alternate display for inquire reset EEPROM b. Decide Yes with & key, Press key return normal display c. EEPROM was reset, Please follow step 1~10 setting again

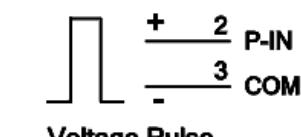
■ TERMINAL DIAGRAM



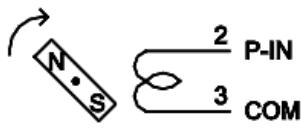
TERMINAL DESCRIPTIONS:

- 1.B-RST terminal:If B-0-M = N(Manual reset),Once terminal B-RST & COM is short,Batch controller reset
 - 2.RUN terminal:a.If batch controller is pulse,Once terminal RUN & COM is short,batch controller continue run
b.If B-0-M = N(Manual reset),Batch controller already reset,Once terminal RUN & COM is short,batch controller will be restart
 - 3.STOP terminal:When batch controller is action,Once terminal STOP & COM short,Controller will be pulse
 - 4.SQRT terminal:When terminal SQRT & COM short,Analog input Rootextractor action
- Note:VR is ON/OFF detect adjust for Magnetic pick-up signal

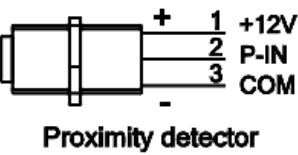
■ Pulse input and internal jumper table



S2-A	S2-B
OFF	OFF

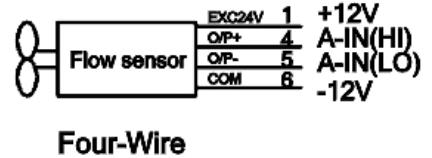
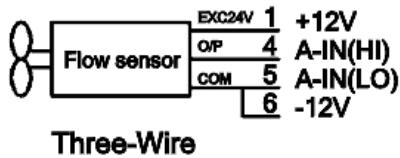
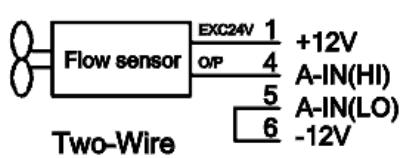


S2-A	S2-B
OFF	ON

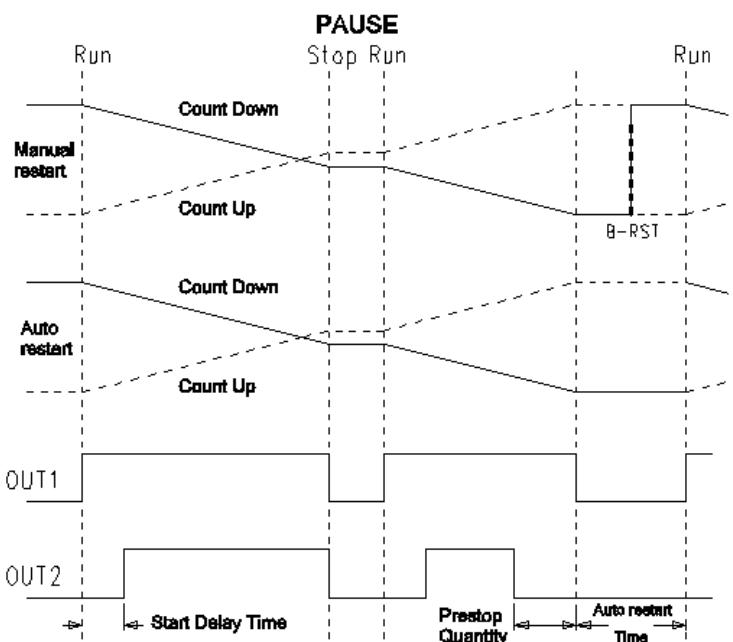
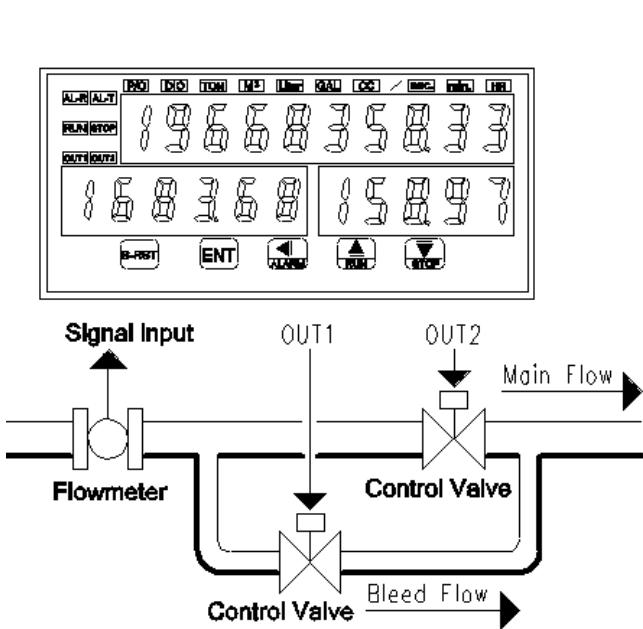


NPN		PNP	
S2-A	S2-B	S2-A	S2-B
ON	OFF	OFF	OFF

■ Analog input



■ Batch operations



Note: The RUN,STOP main function is control OUT1,OUT2 start and pause, but is not effect the signal input count of batch and totalizer.

MRT-B Modbus RTU Mode Protocol Address Map

Data format 16Bit/32Bit sign bit 8000~7FFF(-32768~32767),80000000~7FFFFFFF(-2147483648~2147483647)

Data format 64Bit unsign bit 0000000000000000~FFFFFFFFFFFFFFFFFF(0 ~ (2⁶⁴ -1))

Address	Name	Description	Accept
0000	IN_T	Input Type, Input Range 0000~0002(0~2)(AN/PULSE/MAG-P)	R/W
0001	D_UNIT	Display Flow Unit, Input Range 0000~0004(0~4)(TON/M3/LITER/GAL/CC)	R/W
0002	T_UNIT	Time base Unit, Input Range 0000~0003(0~3)(SEC/MIN/HR/DAY)	R/W
0003	DP_R	Rate Decimal Point, Input Range 0000~0004(0~4)	R/W
0004	DP_B	Batch Decimal Point, Input Range 0000~0004(0~4)	R/W
0005	DP_T	Totalizer Decimal Point, Input Range 0000~0004(0~4)	R/W
0006	DP_KF	Pulse input K-Factor Decimal Point, Input Range 0000~0004(0~4)	R/W
0007	T_BASE	Time Base, Input Range 0001~03E7(0.1~99.9 seconds)	R/W
0008	DSPL_R	Rate Display Low, Input Range 0001~03E7(0~999)	R/W
0009	SQRT_K	Analog input Square Root Constant-K, Input Range 0000~0002(0~2)(0.5/1.5/2.5)	R/W
000A	B_I_M	Batch Controller Counting Mode, Input Range 0000~0001(0~1)(UP/DOWN)	R/W
000B	B_O_M	Batch Controller Output Mode, Input Range 0000~0001(0~1)(N = Manual,A = Auto)	R/W
000C	B_AT_T	Batch Controller Auto-Restart Time, Input Range 0001~03E7(0.1~99.9 seconds)	R/W
000D	T_C_M	Totalizer Counting Mode, Input Range 0000~0001(0~1)(SYN/N-SYN)	R/W
000E	AVG	Average, Input Range 0001~0063(1~99)	R/W
000F	LOCK	Panel Lock, Input Range 0000~0002(0~2)	R/W
0010	ACT_R	Rate Active Direction, Input Range 0000~0001(0~1)(HI/LO)	R/W
0011	T_O_M	Totalizer Alarm output Mode, Input Range 0000~0001(0~1)(N = Manual,A = Auto)	R/W
0012	T_AT_T	Totalizer Alarm Auto-restart Time, Input Range 0001~03E7(0.1~99.9 seconds)	R/W
0013	T_RST	Totalizer Manual Reset, Input Range 0000~0001(0~1)(NO/YES)	R/W
0014	P_UNIT	Totalizer Pulse Unit, Input Range 0000~0003(0~3)(0.001/0.01/0.1/1)	R/W
0015	ADDR	Communication Address, Input Range 0000~00FF(0~255)	R/W
0016	BAUD	Baud Rate, Input Range 0000~0004(0~4)(0:38400,1:19200,2:9600,3:4800,4:2400)	R/W
0017	PARI	Parity Check, Input Range 0000~0003(0~3)(0:N82,1:N81,2:EVEN,3:ODD)	R/W
0018	AO_SEL	Analog Output Select, Input Range 0000~0002(0~2)(RATE/TOTAL/BATCH)	R/W
0019	START_D	OUT2 Start Delay Time, Input Range 0000~0063(0~99 seconds)	R/W
001A	PRESTOP	OUT2 Prestop Counting, Input Range 0000~270F(0~9999)	R/W
001B	DEL_R	Rate Alarm Delay Time, Input Range FF9D~0063(-99~99)	R/W
001C	A_ZERO	Analog Output Zero Adjust, Input Range E890~1770(-6000~6000)	R/W
001D	A_SPAN	Analog Output Span Adjust, Input Range E890~1770(-6000~6000)	R/W
001E	KF	K-Factor, Input Range 00000001~0001869F(1~99999)high word	R/W
001F		K-Factor, Input Range 00000001~0001869F(1~99999)low word	R/W
0020	DSPH_R	Analog input Rate Display High, Input Range 00000000~0001869F(0~99999)high word	R/W
0021		Analog input Rate Display High, Input Range 00000000~0001869F(0~99999)low word	R/W
0022	SCALE	Totalizer Scale, Input Range 00000001~0001869F(0.0001~9.9999)high word	R/W
0023		Totalizer Scale, Input Range 00000001~0001869F(0.0001~9.9999)low word	R/W
0024	CODE_S	Code Setting, Input Range 00000000~0001869F (0~99999)high word	R/W
0025		Code Setting, Input Range 00000000~0001869F (0~99999)low word	R/W
0026	R_ANLO	RATE ANLO, Input Range 00000000~0001869F(0~99999)high word	R/W
0027		RATE ANLO, Input Range 00000000~0001869F(0~99999)low word	R/W
0028	R_ANHI	RATE ANHI, Input Range 00000000~0001869F(0~99999)high word	R/W
0029		RATE ANHI, Input Range 00000000~0001869F(0~99999)low word	R/W

002A	B_ANLO	Batch ANLO, Input Range 00000000~000F423F(0~999999)high word	R/W
002B		Batch ANLO, Input Range 00000000~000F423F(0~999999)low word	R/W
002C	B_ANHI	Batch ANHI, Input Range 00000000~000F423F(0~999999)high word	R/W
002D		Batch ANHI, Input Range 00000000~000F423F(0~999999)low word	R/W
002E	BATCH	Batch, Input Range 00000001~000F423F(1~999999)high word	R/W
002F		Batch, Input Range 00000001~000F423F(1~999999)low word	R/W
0030	AL_R	Rate Alarm, Input Range 00000000~0001869F(0~99999)high word	R/W
0031		Rate Alarm, Input Range 00000000~0001869F(0~99999)low word	R/W
0036	T_ANLO	Total ANLO, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)highest word	R/W
0037		Total ANLO, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
0038		Total ANLO, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
0039		Total ANLO, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)lowest word	R/W
003A	T_ANHI	Total ANHI, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)highest word	R/W
003B		Total ANHI, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
003C		Total ANHI, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
003D		Total ANHI, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)lowest word	R/W
003E	AL_T	Totalizer Alarm, Range 0000000000000000~00000002540BE3FF(0~9999999999)highest word	R/W
003F		Totalizer Alarm, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
0040		Totalizer Alarm, Input Range 0000000000000000~00000002540BE3FF(0~9999999999)	R/W
0041		Totalizer Alarm, Range 0000000000000000~00000002540BE3FF(0~9999999999)lowest word	R/W
0042	DISPLAY_RATE	Rate display range 00000000~0001869F(0~99999)high word	R
0043		Rate display range 00000000~0001869F(0~99999)low word	R
0044	DISPLAY_BATCH	Batch display range 00000000~000F423F(0~99999)high word	R
0045		Batch display range 00000000~000F423F(0~99999)low word	R
0046	DISPLAY_TOTAL	Totalizer display range 0000000000000000~00000002540BE3FF(0~9999999999)highest word	R
0047		Totalizer display range 0000000000000000~00000002540BE3FF(0~9999999999)	R
0048		Totalizer display range 0000000000000000~00000002540BE3FF(0~9999999999)	R
0049		Totalizer display range 0000000000000000~00000002540BE3FF(0~9999999999)lowest word	R
004A	STATUS	Alarm output status, Display range 0000~001F(0~31) Bit0:AL-T, Bit1:OUT2, Bit2:OUT1, Bit3:AL-R, Bit4:RUN=1 / STOP=0	R
004B	BATCH_RESET	Write = 0001(Function 06), Reset batch count (If B_O_M = 0)	W
004C	P_FREQ	Pulse Output Frequency, Input Range 0000~0005(0~5)(0:1,1:5,2:10,3:25,4:50,5:100)	R/W