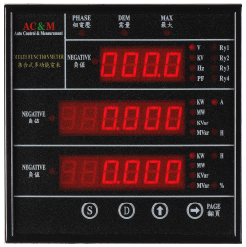
MODEL: DMPW
MULTIFUNCTION METER
OPERATION MANUAL

1. Operation Panel



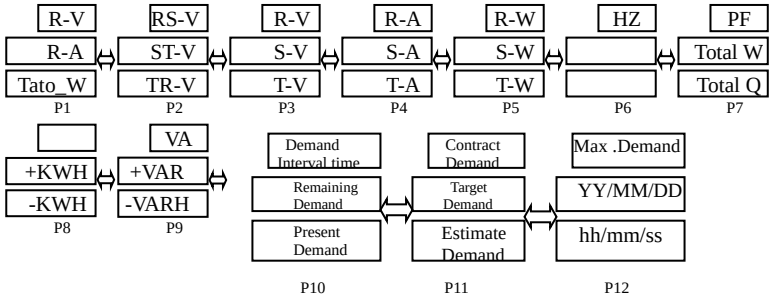
2. Keys

Name	Function	Instruction
S	Setting	Enter setting mode
D	Confirm/Reset value	Confirm setting / Reset value(Demand function)
⇧	Change number / Page up	Change number / Page up
⇨	Change position / Page down	Change position / Page down

3. Display

3-1 Display

Press "↑" and "→" to turn pages.

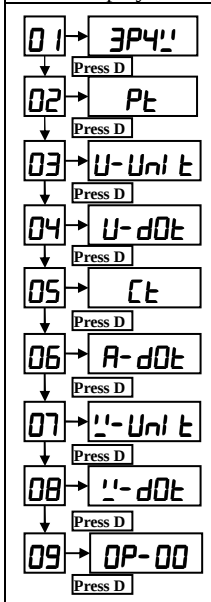


Note：
P1~P9 are for standard model.
3P3W system without P3 display.
P10~P12 are for optional function.

4. Parameters Setting

4-1 Setting procedure

Press 〝S〞 to enter 01-02-03-04-05-06-07-08-09 function. Press 〝D〞 to set.

Display	Function	Instruction
	**Select system**	**Press 〝→〞 to select 3P3W-1P2W-1P-3W-3P4W system** **Press 〝D〞 to enter 02.**
	Set PT ratio	Press 〝→〞 and 〝↑〞 to set PT ratio. Press 〝D〞 to enter 03.
	Set voltage unit	Press 〝→〞 to select V or KV Press 〝D〞 to enter 04.
	Set voltage decimal point	**Press 〝→〞 to set the position.** **Press 〝D〞 to enter 05.**
	Set CT ratio	Press 〝→〞 and 〝↑〞 to set CT ratio. Press 〝D〞 to enter 06.
	Set voltage decimal point	**Press 〝→〞 to set the position** **Press 〝D〞 to enter 07**
	Set Watt unit	Press 〝→〞 to select KW/MW/Kvar/Mvar **Press 〝D〞 to enter 08**
	Set watt decimal point	**Press 〝→〞 to set the position.** **Press 〝D〞 to enter 09.**
	Save setting	Press 〝→〞 and 〝↑〞 to set as 0P-99. Press 〝D〞 . Press 〝↑〞 〝→〞 to key in password 0088. Press 〝D〞 to save .

4-2 Example of setting

Ex 1. System: 3P3W PT：22KV / 110V CT：1000A / 5A Watt=38.10MW
PT ratio=200 CT ratio=200
Parameter setting:

01	Select 3P3W	05	Set CT ratio as 200
02	Set PT ratio as 200	06	**Set no decimal point for A**
03	Set V unit as KV	07	Set W unit as MW
04	**Set V decimal point as 2 digit after decimal point**	08	**Set W decimal point as 2 digit after decimal point**

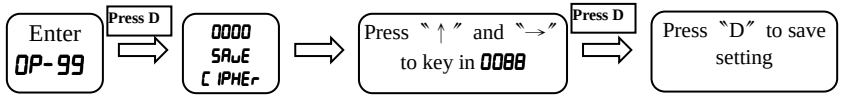
EX 2. System: 3P4W 380/220V CT：600A/5A W=380 x 600 x 1.732 = 396.0KW
PT ratio=1 CT ratio=120
Parameter setting:

01	Select 3P4W	05	Set CT ratio as 120
02	Set PT ratio as 1	06	**Set A decimal point as 1 digit after decimal point**
03	Set V unit as V	07	Set W unit as KW
04	**Set V decimal point as 1 digit after decimal point**	08	**Set W decimal point as 1 digit after decimal point**

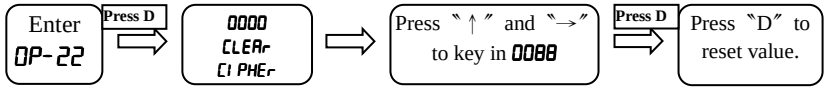
Note：If meter display 〝9999〞 and flash, it means decimal point setting is incorrect.

4-3 Save setting (Code:0P-97)

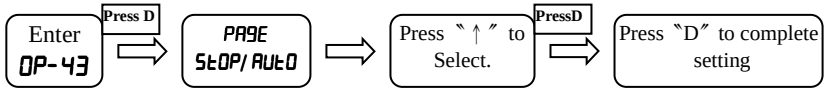
PM96 has password protection function. Key in password to validate setting.
Preset password: 0088



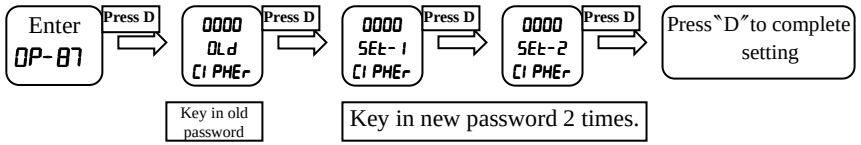
4-4 Accumulated Values Reset (Code:0P-22)



4-5 Auto Page-turning Setting (Code:0P-43)



4-6 Change password (Code:0P-87)

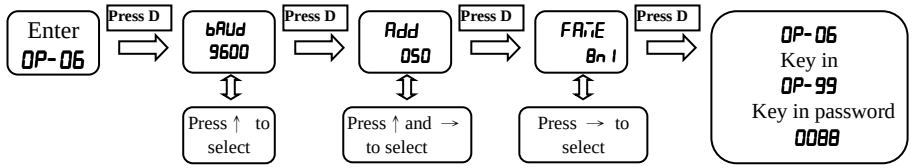


5. Communication Setting

5-1 Function

Baudrate setting: 9600-19200-38400-1200-2400-4800 (selectable)
Communication bit: 8N1/8N2/Even/Odd (selectable)
Communication address: 1-255

5-2 Operation



5-3 Communication Protocol

MODBUS－RTU MODE

Data Format

(ID Number) 1Byte	(Function Code) 1Byte	(Data) N Byte	CRC 2 Byte

Function Code

03 (03H)	Read parameters of meter
06 (06H)	Set parameter.

Example 1. Read R phase voltage of the Meter.

Master sends message to Meter TX：01 03 00 01 00 01 D5 CA (Total: 8 Byte)				
(ID Number) 1Byte (01H)	Function Code 1Byte (03H)	Address 2Byte (00 01H)	Data Number 2Byte (00 01H)	CRC 2Byte (D5 CA)

Master calls Meter ID number 1 to read address 0001.Data number 0001.

Meter responses to Master				
(ID Number) (01H)	Function Code (03H)	Data Byte (02H)	Data (xx,xxH)	CRC (xxH,xxH)

Example 2. Read parameters of the Meter

Master sends message to Meter (Total :8 bytes)				
(ID Number) 1Byte (01H)	Function Code 1Byte (03H)	Address 2Byte (00 02H)	Data Number 2Byte (xxH,xxH = N)	CRC 2Byte (xxH,xxH)

Meter responses to Master				
(ID Number) (01H)	Function Code (03H)	Data Byte (XXH = N)	Data (N*2Byte) XxH,xxH.xxH.....	CRC (xxH,xxH)

Example 3. CT ratio setting: CT ratio=100
(Function Code: 06H；CT ratio setting address: 40027)

Master sends message to Meter				
(ID Number) 1Byte (01H)	Function Code 1Byte (06H)	Address 2Byte (1BH)	Data Number 2Byte (0064H)	CRC 2Byte (xxH,xxH)

5-4 Parameter/Address Cross-reference

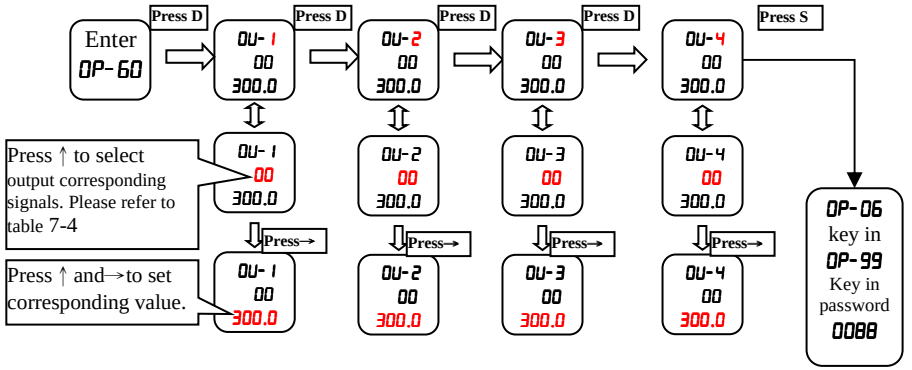
Address	Name	Length	Explanation / Feature / Display range	(R/W)
40002	V1	1Word	R-S Voltage / 0-65535 Integral / 0 ~ 9999Count	
40003	V2	1Word	S-T Voltage / 0-65535 Integral / 0 ~ 9999 Count	
40004	V3	1Word	T-R Voltage / 0-65535 Integral / 0 ~ 9999 Count	
40005	A1	1Word	R Current / 0-65535 Integral / 0 ~ 9999 Count	
40006	A2	1Word	S Current / 0-65535 Integral / 0 ~ 9999 Count	
40007	A3	1Word	T Current / 0-65535 Integral / 0 ~ 9999 Count	
40008	W1	1Word	R Watt / -32768~32767 Polar / 0~9999 Count	
40009	W2	1Word	S Watt / -32768~32767 Polar / 0~9999 Count	
40010	W3	1Word	T Watt / -32768~32767 Polar / 0~9999 Count	
40011	W	1Word	RST Watt / -32768~32767 Polar / 0~9999 Count	
40012	Q	1Word	RST Var / -32768~32767 Polar / 0~9999 Count	
40013	PF	1Word	Power Factor / 32768 ~ 32767 Polar / - 0.500 ~ 1.000 ~ + 0.500	
40014	HZ	1Word	Frequency / 0-65535 Integral / 0 ~ 9999Count	R
40015 40016	+WH	2Word	RST Watthour (+) Long type 40015 Lo-Word 40016 Hi-Word	
40017 40018	-WH	2Word	RST Watthour (-) Long type 40017 Lo-Word 40018 Hi-Word	
40019 40020	+QH	2Word	RST Varhour (+) Long type 40019 Lo-Word 40020 Hi-Word	
40021 40022	-QH	2Word	RST Varhour (-) Long type 40021 Lo-Word 40022 Hi-Word	
40023	W,V,A Point	1Word	(1 Word)0000 0011 0001 0011 W=bit8-bit11 0011 V=bit4-bit7 0001 A=bit0-bit3 0011	
40024	Realy W/V Unit	1Word	Bit7(RY4) Bit6(RY3 Bit5(RY2) Bit4(RY1) Bit2(1=kv 0=V) Bit1(1=MW 0=KW) Bit0(Demand 0=W 1=V/A)	R/W
40025	BaudRate	1Word	0=1200,1=2400,2=4800,3=9600,4=19200,5=38400	
40026	Address	1Word	Address 1-255	
40027	CT	1Word	CT ratio: 0-9999	
40028	PT	1Word	PT ratio: 0-9999	
40029	MODE	1Word	System 0=3P4W 1=1P2W 2=1P3W 3=3P3W	

6. Analog Output Setting (optional)

6-1 Output function

1.4 units DC 4-20mA output
2.Output >500Ω at 20mA
3.DC 4~20mA corresponds to 10 signals (Please refer to table 7-4)

6-2 Setting

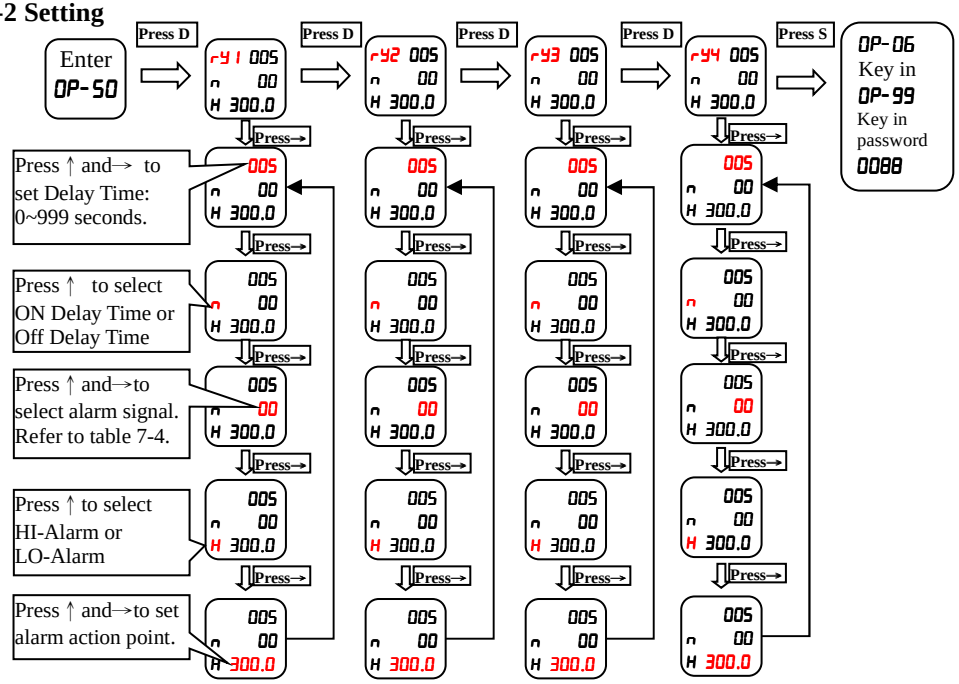


7. Alarm Setting Function (Optional)

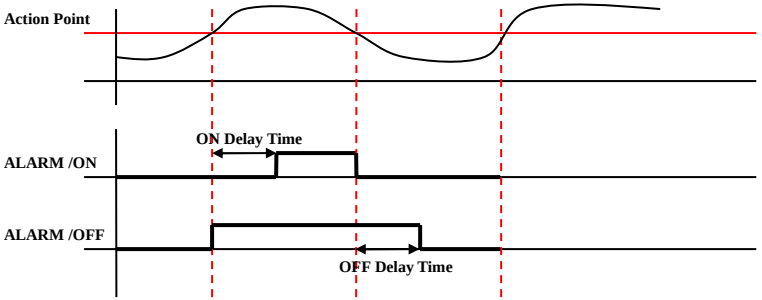
7-1 Function

1.4 units of relay outputs
2. Setting: ON /OFF and Delay Time (0-999 Sec)
3.Set alarm for 14 signals (Please refer to table 7-4)

7-2 Setting



7-3 ON/OFF Delay Time function instruction.



7-4 Output corresponding signal code

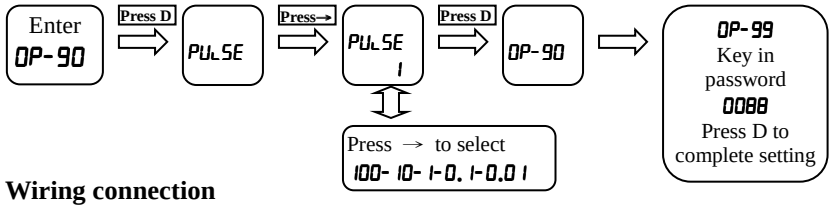
Code	Corresponding Signal	Range	Code	Corresponding Signal	Range	
00	A Voltage	9999	07	Total Var	9999	
01	B Voltage	9999	08	Power Factor	-0.5~1~0.5	
02	C voltage	9999	09	Frequency	60 ±5HZ /50 ±5HZ	
03	A Current	9999	10	Present demand	9999	Note： MA output without code 10,11,12,16,17
04	B Current	9999	11	Max. Demand on record	9999	
05	C Current	9999	12	Forecast Demand	9999	
06	Total Watt	9999	16 / 17	0 phase Voltage/Current	9999	

8.(DO)Pulse Output (Optional)

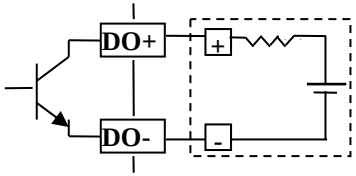
8-1 Function

1. 2 units output: DO1 for (+WH) DO2 for (-WH)
2. Programmable for: (100-10-1-0.1-0.01) Pulse / kwh

8-2 Setting



8-3 Wiring connection



9. 3Phase Voltage/Current unbalance(%) (Optional)

1.Display

Press ↑ and → to turn page.

2. Equation:

(MAX – MIN) / MAX * 100%

UnbL
V unbalance%
A unbalance%

10. Zero phase Voltage/Current (Optional)

1. Display

Press ↑ and → to turn page.

V0 Voltage
A0 Current
0- -U-A

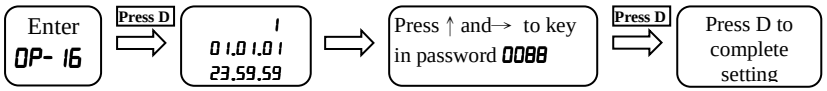
11. Clock (Optional)

1. Display

Press D to enter clock mode. Press ↑ and→ to turn page.
Press D to leave.

Week
YY/MM/DD
hh/mm/ss

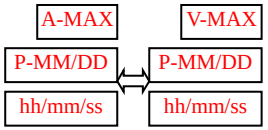
2.Adjustment



12. Voltage/Current max value record(Optional)

1. Display

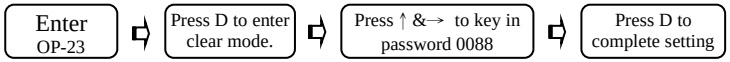
Press ↑ and→ to turn page.



2. Function

1. Record the max.values of 3 phase voltage / current
2. Record the MM/DD/hh/mm/ss of the max value.

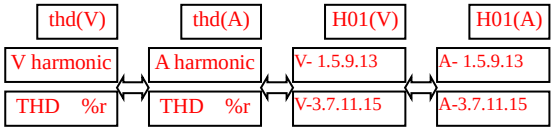
3. Clear the max value



13. Harmonic Analysis (Optional)

1. Measure Voltage and Current harmonic (Thd%)
2. Up to 31 times harmonic analysis. Display 15 times of odd harmonic.
3. Display

Press D to enter，press ↑ and → to turn page.
Press D to leave.



14. Demand Control (Optional)

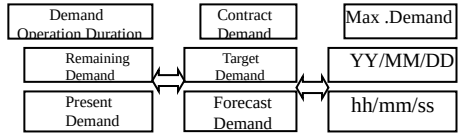
14-1. Function

*Programmable for Demand operation duration
*Set Target Demand/Contract Demand.
* Record Max.Demand and it's happening date and time.
* Set alarm for Over Demand

14-2. Term Explanation

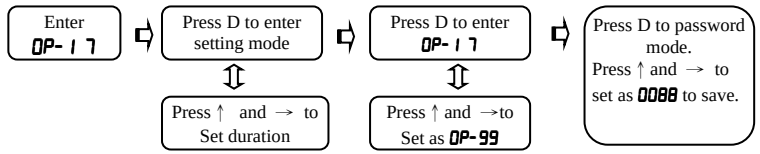
1. **Contract Demand:** During the Demand operation duration, the Max. electricity you can use according to the contract with the power company.
2. **Target Demand:** Generally, it's set as 75% of the Contract Demand.
3. **Present Demand**: During the Demand operation duration, the electricity you have used.
4. **Forecast Demand(Estimate Demand):** During the Demand operation duration, estimate the electricity you will use.
5. **Remaining Demand**: During the Demand operation duration, the remaining electricity you can use.
6. **Max. Demand:** During the Demand operation duration, the Max. electricity used on record.

14-3. Display

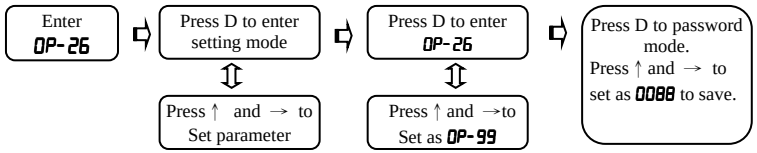


14-4. Basic setting

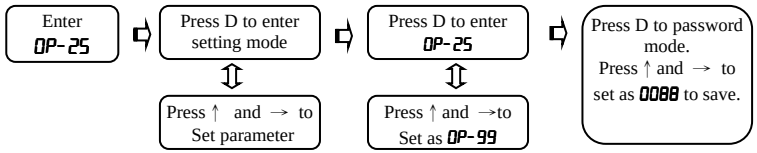
1. Demand Operation Duration Setting (0-60 mins)



2. Contract Demand Setting



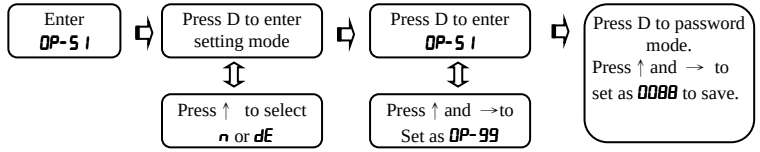
3. Target Demand Setting



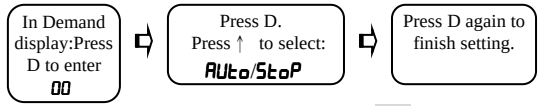
4. Clear The Max. Demand Record

14-5. Demand Alarm Setting

1. Select Alarm Function: (**N**- for Normal signal alarm(A,V,W,Var...) ; **DE**-for Demand alarm)

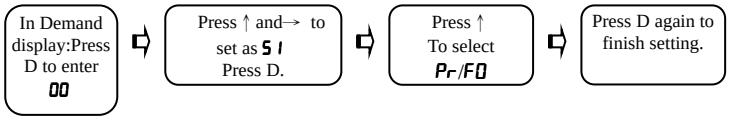


2. Activate Demand Alarm: Auto(activate)/Stop



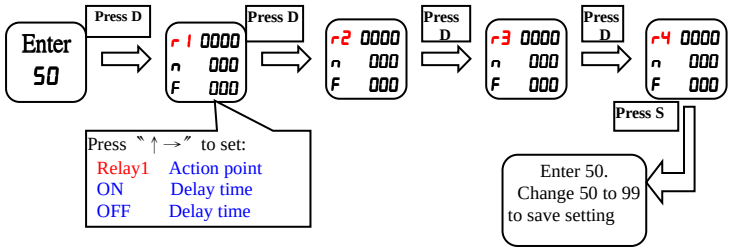
**Before you do any demand alarm setting,first you need to set alarm as STOP,
After you finish setting, you need to set the alarm back to Auto to activate alarm function.

3. Demand Alarm Corresponding Signal Setting: (FO / PR) *Set alarm in STOP mode first.
FO= Forecast Demand
PR= Present Demand

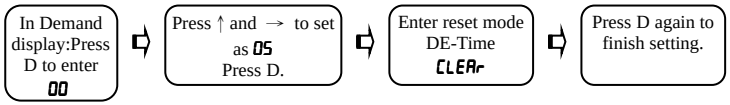


4. Demand Alarm Instruction
* Select FO = Forecast Demand
Relay activated when Forecast Demand exceeds Target Demand
(Note：Only need to set ON/OFF delay time for relay, no need to set action point.
* Select Pr =Present Demand
Relay activated when Present Demand exceeds the set action point.

Relay Setting:
In Demand display, press D to enter 00. Press ↑ and → to set as 50. Press D to enter setting mode.



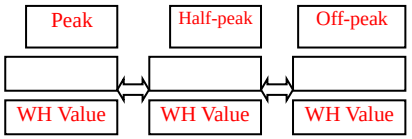
5. Reset Demand and Demand Operation Duration *Set alarm in STOP mode first.



15. Period Charge (Optional)

15-1.Display

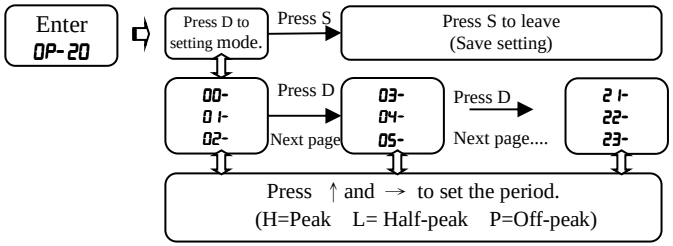
Press ↑ and → to turn page.



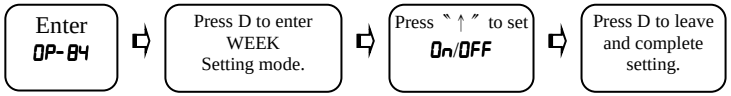
15-2.Setting instruction

1. .Set every hour of 24 hours as **Peak**, **Half-peak** or **Off-peak** according to your requirements.
2. **H=Peak period L= Half-peak period P=Off-peak period**
3. The electricity consumption of different periods will be accumulated to 3 different screens

Setting



4. Weekend period charge
If weekend (Saturday & Sunday) has different charge, activate weekend period charge.
Operation:



Note：Set as ON, Saturdays and Sundays have different charge.
Set as OFF, the charge of Saturdays and Sundays is the same as usual days.

5. Weekend period setting
1. Enter OP-48
2. Setting procedure is the same as 15-2.3.

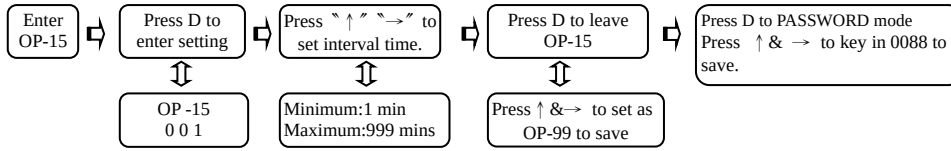
16. Paperless Record (Record 10000 DATA)

16-1 Function:

1.Record 10000 data，3V-3A-W –Var-PF- +WH
2.Record format:Display: MM/DD/hh/mm – DATA
3.10 year power-off memory
4.Save interval time:1~999 min.
5.Meter has to work with AC&M software **UserAcm**.

16-2. Setting

1.Set save interval time:



2.Clear data(It will take some time)**

16-3.UserAcm Installation

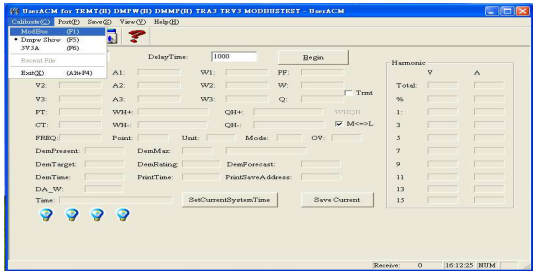
1. UserAcm install name:UserAcm2147setup.exe
2. For: win98/win2000/winxp

16-4.UserAcm operation

1. Run the program

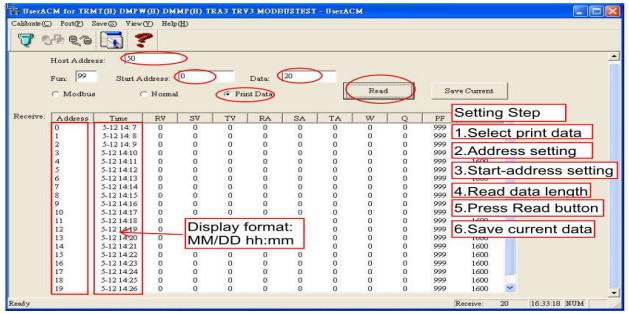
Click on the icon.

2. UserAcm screen



Click Calibrate— select Modbus

3. Display and Setting steps:



17. Parameter/Address Cross-reference

Address	Name	Note / Feature	Write/Read (W/R))
Demand Control			
40032	MAX DE	Max.Demand on record	R
40033	YY/MM	Max.Demand happening time. BCD format.	
40034	DD/hh		
40035	mm/ss		
40036	Target Demand		
40037	Contract Demand		
40038	Forcast Demand		
40039	Present Demand		
40040	Demand interval time		
Harmonic Analysis			
40047	V-H1	Voltage 1 time harmonic	R
40048	V-TH-Total	Voltage total harmonic	
40049	V-TH %	Voltage total harmonic %	
40050-56	V-H 3-15	Voltage 3-15 times /odd harmonic 3-5-7-9-11-13-15	
40057	A-H1	Current 1 time harmonic	
40058	A-TH-Total	Current total harmonic	
40059	A-TH %	Current total harmonic %	
40060-66	A-H 3 -15	Current 3-15 times /odd harmonic 3-5-7-9-11-13-15	
VA / Var / PF of each Phase			
40067	S-V1	Total voltage	R
40068	S-A1	Total Current	
40069	Tota-VA	Total VA	
40070	R-VA	R phase VA	
40071	S-VA	S phase VA	
40072	T-VA	T phase VA	
40073	Tota-Q	Total Var	
40074	R-Q	R phase Var	
40075	S-Q	S phase Var	
40076	T-Q	T phase Var	
40077	Tota-PF	Total power factor	
40078	R-PF	R phase power factor	
40079	S-PF	S phase power factor	
40080	T-PF	T phase power factor	
Zero-phase voltage& 3 Phase Voltage/Currrent unbalance%			
40081	V unbalance	Voltage unbalance	R
40082	A unbalance	Current unbalance	
40083	Zero phase V	Zero phase Voltage	
40084	Zero phase A	Zero phase Current	

Period Charge			
40201 40202	Total(WH)	Total WH Long type 40201 Lo-Word 40202 Hi-Word	**R**
40203 40204	1st period (Peak)	1st period WH Long type 40203 Lo-Word 40204 Hi-Word	
40205 40206	2nd period (Half-peak)	2nd period WH Long type 40205 Lo-Word 40206 Hi-Word	
40207 40208	3rd period (Off-peak)	3rd period WH Long type 40207 Lo-Word 40208 Hi-Word	
40221	A-MAX	Current Max.Value	**R**
40222	Phase	Happening Phase	
40223	MM/DD	Happening Month/Date	
40224	hh/mm	Happening hour/minute	
40225	ss	Happening second	
40226	V-MAX	Voltage Max.Value	
40227	Phase	Happening Phase	
40228	MM/DD	Happening Month/Date	
40229	hh/mm	Happening hour/minute	
40230	ss	Happening second	