SmartMonitor System

PM-300

3-phase multifunction digital meter

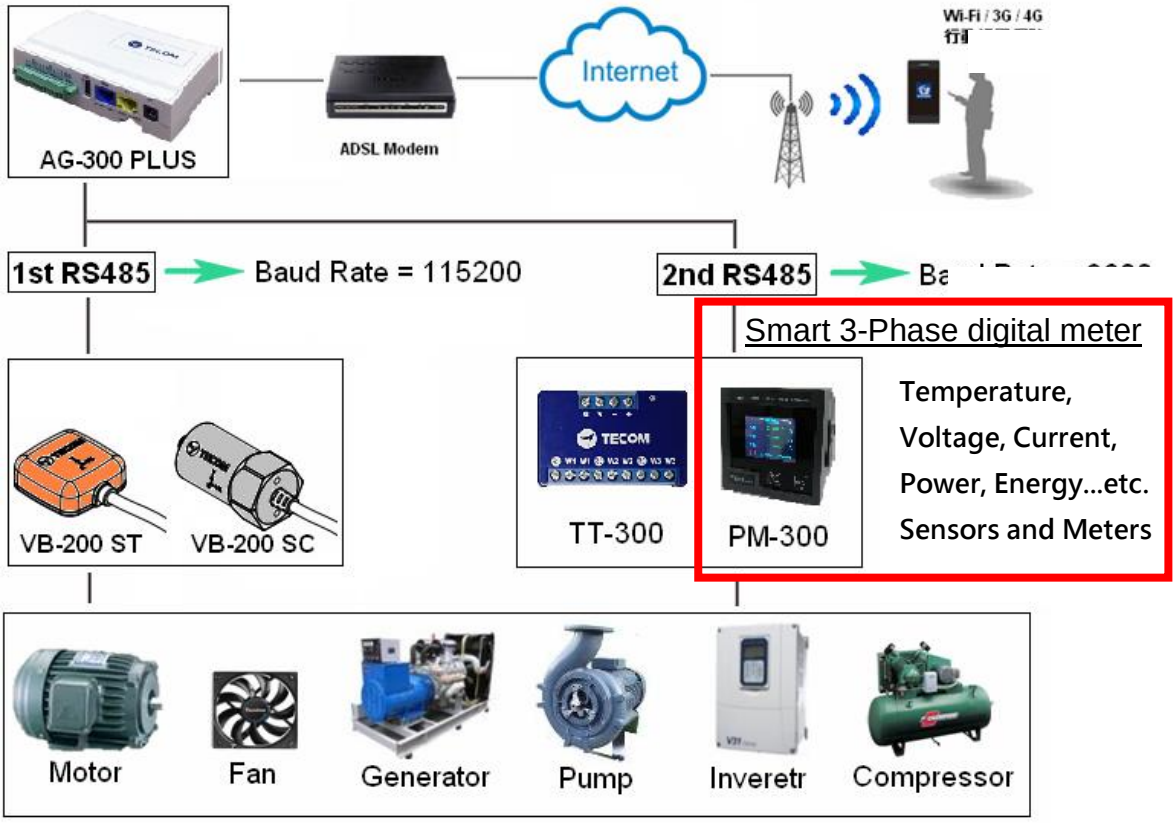
Operation Manual

Ver: R01 D/C: 107-0514

Content

Introduction

Tecom PM-300 smart three-phase digital meter is a smart device suitable for medium and low voltage systems. It integrates data collection and control functions. It also has power parameter measurement and energy calculation. It provides communication connector and computer monitoring system connection, supports RS485 interface , MODBUS-RTU protocol and dedicated display module for displaying multiple data messages. The intuitive user interface is simple and easy operation.



Product Features

Complete functions: Use a single meter to achieve the measurement of the overall current, voltage, power, frequency, power factor, and statistics of electricity consumption.

High reliability: Professional design, in line with international and IEC standards of anti-jamming performance, in line with ISO9000 quality assurance.

Small size: Ultra small size can be installed in the drawer compartment of the switchboard.

Easy installation: Self-locking installation mechanism is adopted, and installation or disassembly is very convenient and quick.

Flexible wiring: Various wiring methods suitable for high and low voltage systems.

Easy to configure: It adopts RS485 communication interface and supports Modbus-RTU. It can be connected with various PLCs in the industry and communicate with various software.

Tecom Smart Monitor System

Tecom Smart Monitor System series products are shown as follows:

Product	MMK-Motor (MMK-2000)	MMK-SGR (MMK-2100)	Vibration Gauge -ST (MMK-2200)	Vibration Gauge -SC (MMK-2210)	Temperature Gauge (MMK-2300)
Content	AG-300 Plus x 1 PM-300 x 1 TT-300 x 1 TS-200 x 2 VB-200ST x 1	AG-300 Plus x 1 PM-300 x 1 TT-300 x 2 TS-200 x 4	AG-300 Plus x 1 VB-200ST x 1	AG-300 Plus x 1 VB-200SC x 1	AG-300 Plus x 1 TT-300 x 1 TS-200 x 3

This manual provides instructions for operating the PM-300.

1. System combination

(1) PM-300 : Smart three-phase multifunctional digital meter

(2) Operation Manual

2. Appearance of PM-300

3. System specifications

Relay output

- Output type : Mechanical contact
- Maximum switching voltage : 250VAC, 30VDC
- Maximum switching current : 5A

Equipment withstand voltage, insulation strength

- Power supply, voltage loop > 2KV
- Current loop > 2.5KV

Switch input

- Photocoupler isolation
- Isolated voltage : 2500Vrms
- Passive empty contact input
- Passive empty contact input : 85 ~ 265V AC/DC
- Power consumption : < 4W

Communication : RS-485 interface

- Baud Rate : 2400 ~ 57600bps (optional)
- Modbus-RTU, DL/T645 protocol

Input voltage

- Rated coltage : 100VAC or 400VAC, allow 20% to exceed the limit
- Overload: 2 times the rated value (continuous); 2500VAC/1 second (non-recycling)
- Measurement type : True RMS
- Rated frequency : 45 ~ 65Hz
- PT loop power consumption: <0.2VA

Input current

- Rated current : 5A or 1A, 20% limit allowed
- Overload: 2 times rated (continuous); 100A/1 second (non-return)
- Measurement Form : True RMS
- Frequency range : 45 ~ 65Hz
- CT loop power consumption : < 0.2VA

Accuracy specifications

parameters	accuracy	Resolution	Range
Voltage U(Volts)	0.2%	0.1%	0 ~ 999,999V
Current I(Amps)	0.2%	0.1%	0 ~ 30,000A
Active Power P(KW)	0.5%	0.1%	0 ~ 999,999KW
Reactive Power Q(KVAR)	2.0%	0.1%	0 ~ 999,999KVAR
Apparent Power S(KVA)	0.5%	0.1%	0 ~ 999,999KVA
Power Factor (COSΦ)	0.5%	1.0%	-0.6 ~ 1.0

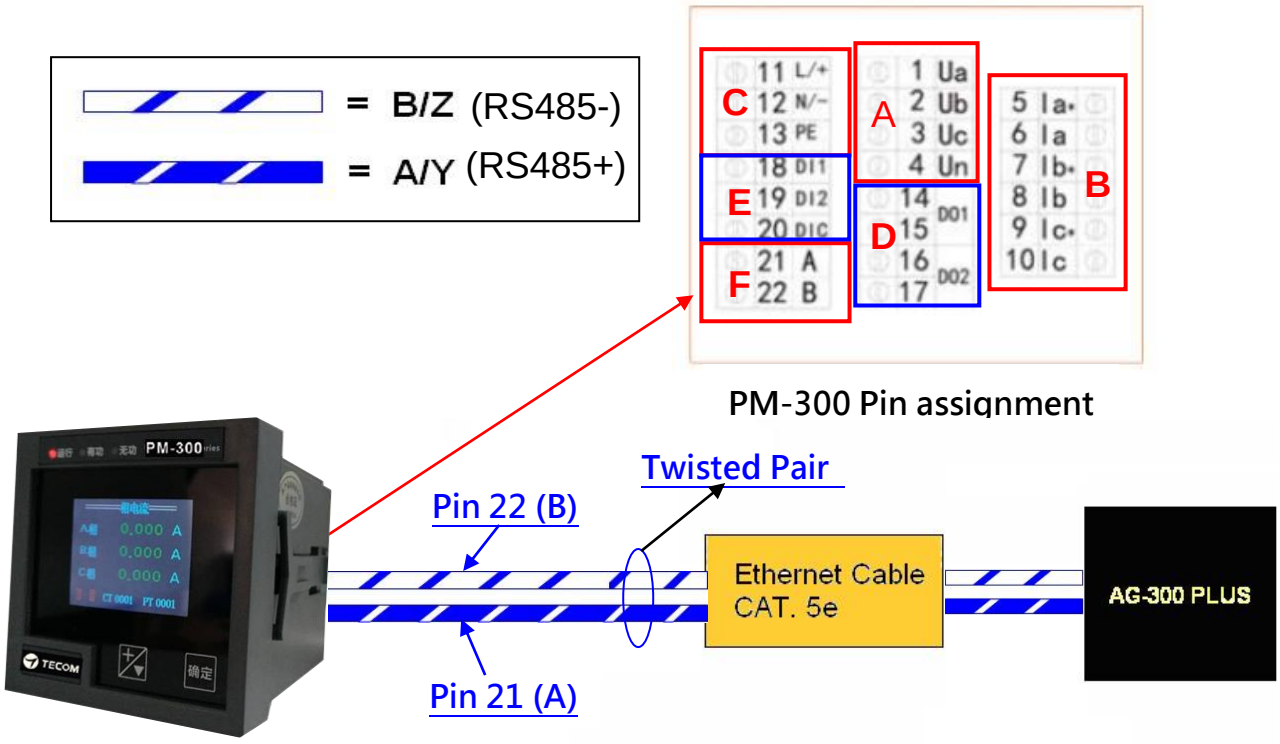
Frequency F(Hz)	0.02Hz	0.1Hz	45 ~ 65Hz
kilowatt-hour (KWH/KVARH)	0.5%	1KWH, KVARH	0 ~ 999,999,999(KWH/KVARH)
kilovar-hour meter (KWH/KVARH)	2.0%	1KWH, KVARH	0 ~ 999,999,999(KWH/KVARH)

Operating Temp. : -20℃ ~ +55℃ ; Storage Temp. : -40℃ ~ +85℃ ;
Humidity range : 0 ~ 95% without condensation

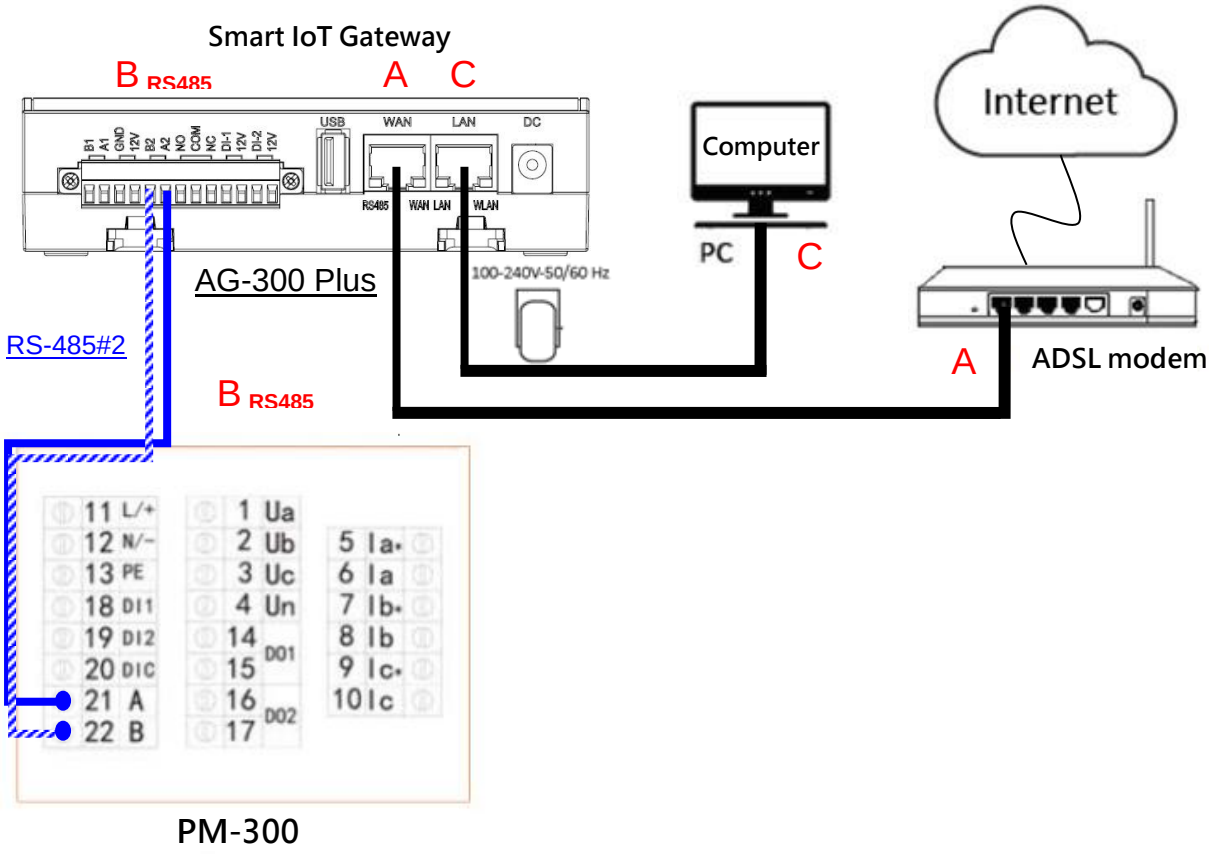
4. Wiring

Please connect the device as shown in the connection diagram below.

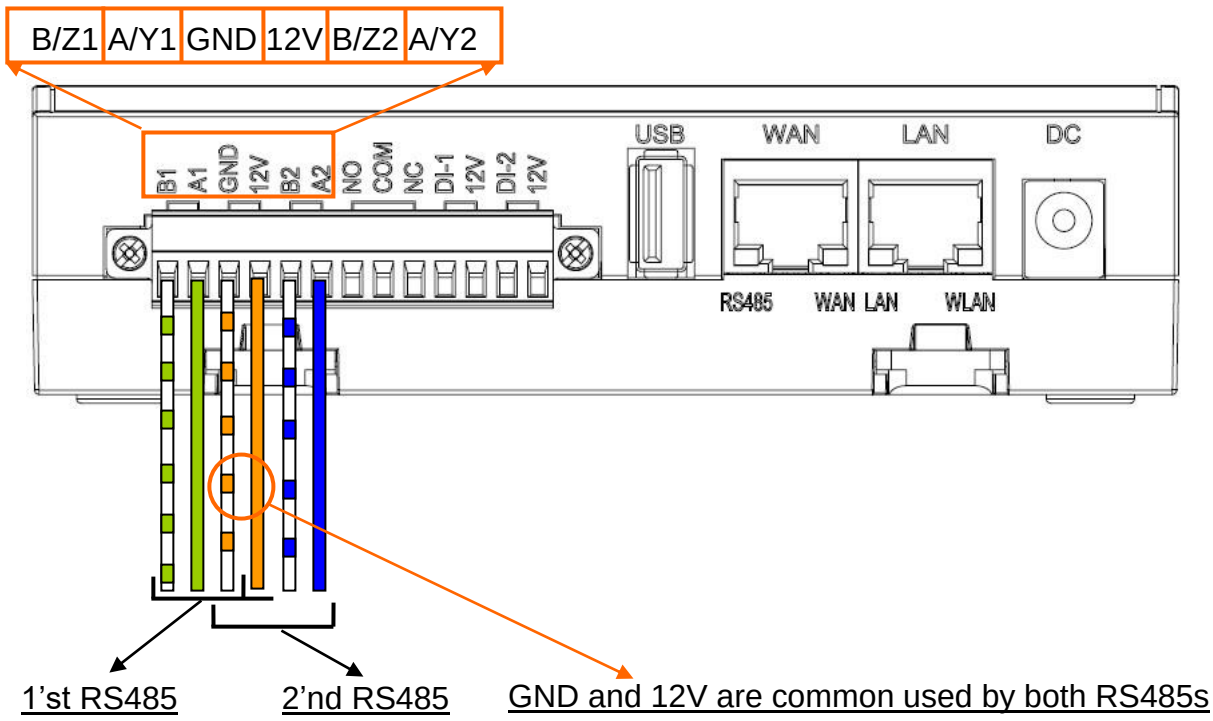
A. Pins 1~4: Three-phase voltage (potential transformer PT) and ground input.
B. Pin 5~10: Three-phase current (current transformer CT) input.
C. Pins 11~13: PM-300 device power supply 220V input (<264V).
D. Pins 14~17: Digital output 1 & 2 output contacts (DO1, DO2).
E. Pin 18~20: Digital Input 1 & 2 input contacts (DI1, DI2, Common).
F. Pin 21~22: RS-485 signal (A,B).



- RS485 connection method for PM-300 and AG-300 Plus



- AG-300 Plus pin diagram



5. PM-300 PT/CT wiring method

Attention and warnings

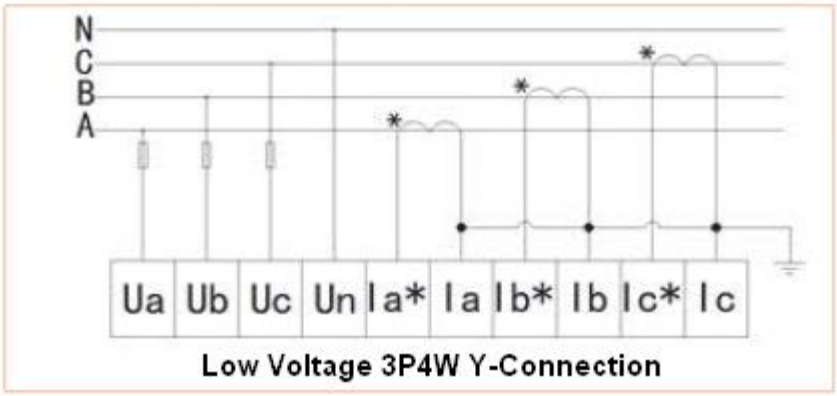
(1) It is prohibited to carry out wiring work during power is on line.

(2) After the input power cut OFF, do not touch the circuit or change the wiring before the status P LED of PM-300 went off.

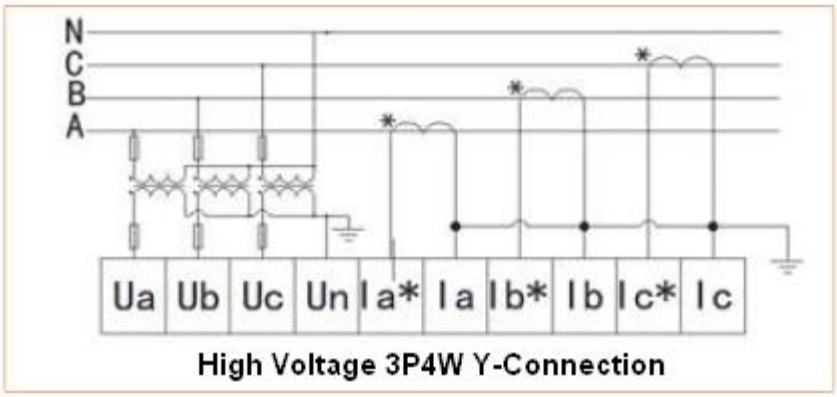
(3) The Ia/Ib/Ic & Ia*/Ib*/Ic* input terminals for current measurement and Ua/Ub/Uc/Un input terminals for voltage measurement MUST NOT be inter-connected.

(4) Please refer to the following wiring connection for integrating CT and PT together.

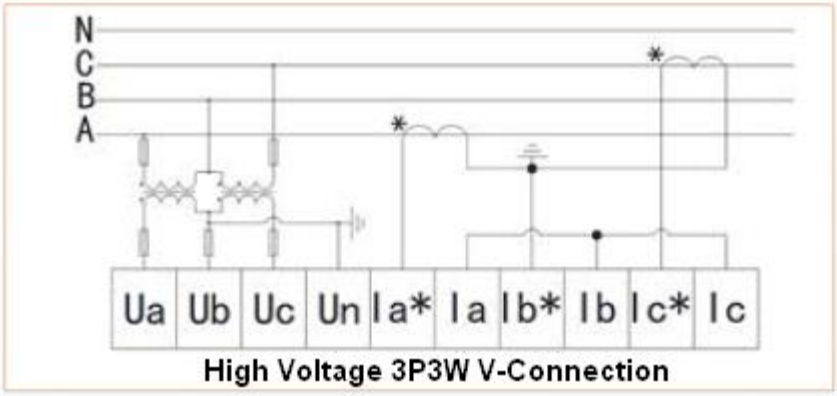
(5) After the completion of wiring, Power ON can only be conducted after the confirmation together with the on-site electricians.



Low Voltage 3P4W Y-Connection



High Voltage 3P4W Y-Connection

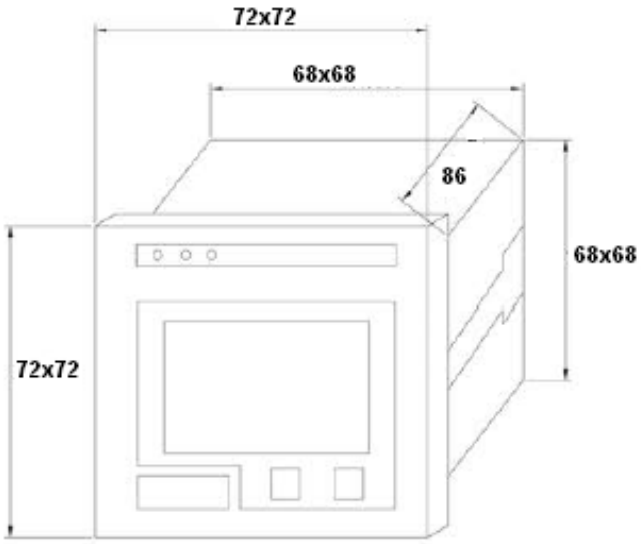


High Voltage 3P3W V-Connection

6. Dimensions of devices

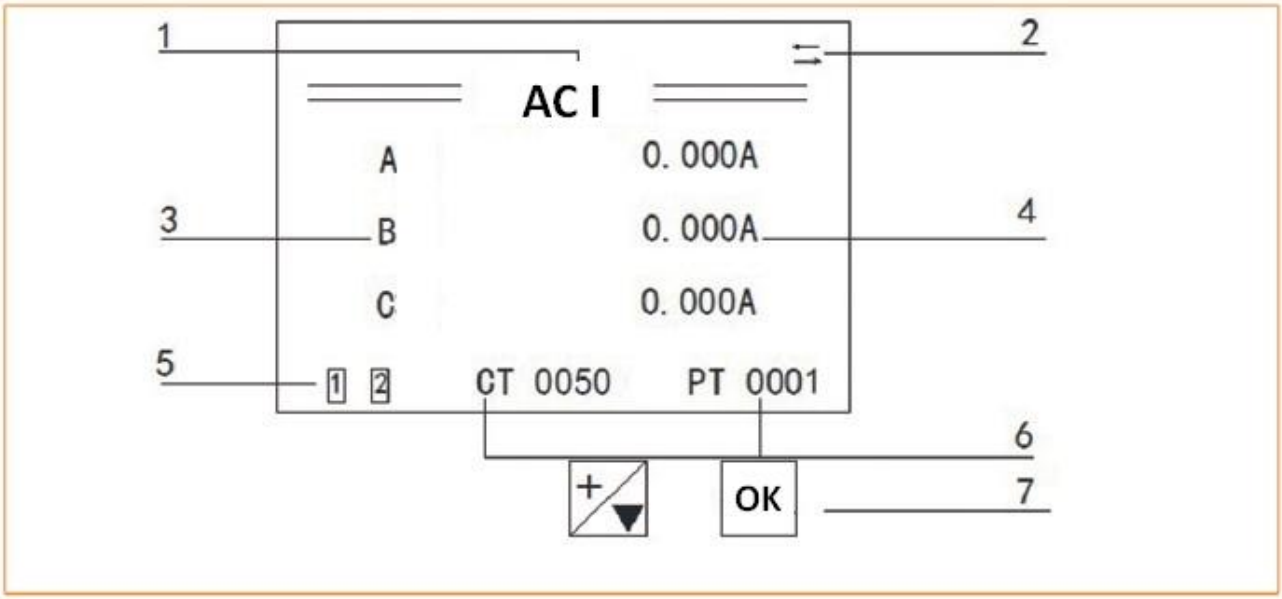
PM-300 dimension : 72mm (L) x 72mm(W) x 86mm (H)

7. PM-300 View



8. Operation Interface

8.1 Main display interface



8.1.1 Display the current interface physical quantity, the main interface shows the load current, and the display value is the actual primary-side current value;

8.1.2 When the device communicates with the background data, the logo flickers, indicating the data sending and receiving status;

8.1.3 shows the corresponding phase sequence;

8.1.4 Display the real-time data value of the corresponding physical quantity. The data is the primary-side data value;

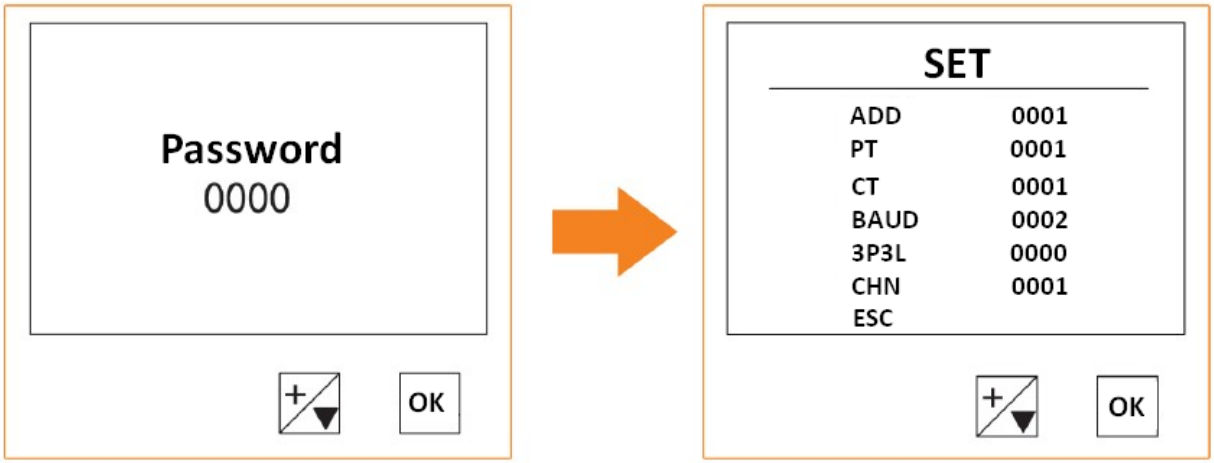
8.1.5 The icon is the switch status display identifier. The open sign indicates that the current switch status is open, and the fill status sign indicates that the current switch status is closed;

8.1.6 After the transformer ratio is set internally, the main interface will be displayed in real time for easy viewing.

8.1.7 Buttons: Page up or number increase button; OK button;

8.2 Parameter Settings

In the display interface, press  and enter the password 0004 to enter the parameter setting mode.



Parameter definition

8.2.1 **ADD** : RS485 ID, setting range 1~255, the station number of the digital meter accessing the back-end system, the initial value is 0001 (PS. When used with AG-300 Plus, the settable range is 0 ~ 15.);

8.2.2 **PT** : Ratio of potential transformer (PT), for example 10KV/100V, setting value is 100;

8.2.3 **CT** : current transformer (CT) ratio, for example 400A/5A, setting 80;

8.2.4 **BAUD** : Baud Rate, setting range 1~4, communication transmission speed of the digital meter to background system, 1 → 4800bps, 2 → 9600bps, 3 → 19200bps, 4 → 38400bps

8.2.5 **3P3L** : Set to 0000, indicating that the three-phase four-wire (3P4W) connection mode measurement type; Set to 0001, indicating that the three-phase three-wire (3P3W) mode of operation measurement;

8.2.6 **CHN** : Set to 0000, indicating the digital meter is in Chinese mode; Set to 0001, indicating the digital meter is in English mode;

8.2.7 **ESC** : Sign out.

Device settings

Before formal installation of PM-300 digital meter, please follow the manual of MMK-2000 motor maintenance package and MMK-2100 switchboard maintenance package to set up and install the smart monitor system.

1. Motor Configuration and Switchboard Configuration

Please refer to MMK-2000 and MMK-2100 user manual for motor configuration setting.

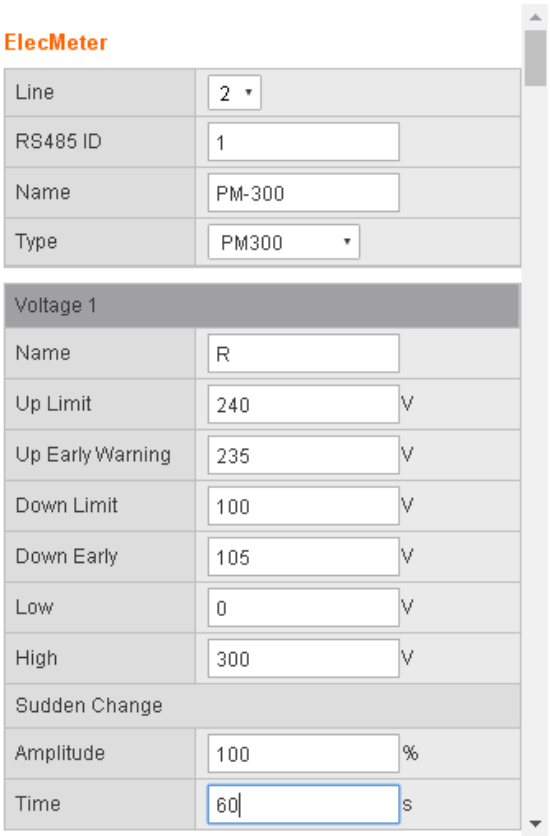
2. ElecMeter (PM-300) Settings

The RS485 ID setting of the PM-300's hardware must be set through the key operation on the meter display (please refer to 8.2.1). After the RS485 ID of the PM-300 is set, please follow the following settings on the gateway AG-300 Plus to

set the RS485 ID corresponding to the PM-300.

- To add ElecMeter, please click the【+】button under ElecMeter Item.

- To Select【PM300】in the Type field



- Line: Select to use line 1 or line 2, **(Please select line 2 for PM-300).**
- RS485 ID: Please fill in according to RS485 specification.
- Name: PM-300 or defined by user.
- Type: Please Select PM300.

Voltage 1/2/3

- Name : Please specify phase R/S/T.
- Limit: Overvoltage alarm value, please fill in the motor specifications.
- Up Early Warning: Overvoltage warning value, please fill in according to the motor specifications.
- Down Limit: Under Voltage alarm value, please fill in the motor specifications.
- Down Early: Under Voltage warning value, please fill in the motor specifications.
- Low: Minimum voltage value, please fill in the specifications.
- High: Maximum voltage value, please fill in the specifications.

Sudden Change

- Amplitude: Please fill in the required values.
- Time: Please fill in the required values.

Current

Current 1		
Name	R	
Limit	330	A
Early Warning	320	A
Down Limit	0	A
Down Early	0	A
Low	0	A
High	400	A
Sudden Change		
Amplitude	100	%
Time	60	s

- Name : Please specify phase R/S/T.

- Limit: Over Current alarm value, please fill in the motor specifications.

- UP Early Warning: Over Current warning value, please fill in the motor specifications.

- Down Limit: Undercurrent alarm value, please fill in the motor specifications.

- Down Early: Undercurrent warning value, please fill in the motor specifications.

- Minimum: Please fill in according to motor specifications.

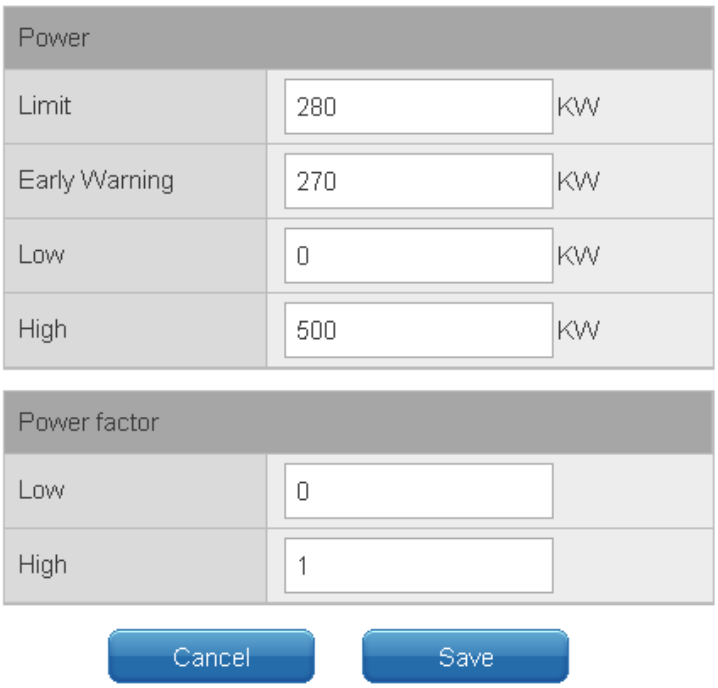
- Maximum: Please fill in the motor specifications.

Sudden Change

- Amplitude: Please fill in the required values.

- Time: Please fill in the required values.

Power



- Limit: Power alarm value, please fill in accordance with the motor specifications.

- Early Warning: Power warning value; please fill in accordance with the motor specifications.

- LOW: Low power value; please fill in accordance with the motor specifications.

- High: High power value; please fill in accordance with the motor specifications.

Power factor

- LOW: 0~1, please fill in accordance with the motor specifications.

- High: 0~1, please fill in accordance with the motor specifications.

- **After the setting is completed, click the [Save] button below.**

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Ver:01 2018.05