User's manual

V2.0

Single-phase multifunctional standard watt-hour meter

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➢ Chapter 1 Product Overview

DLM-9560B single-phase multifunctional standard watt-hour meter is a high-precision multifunctional wide-range standard watt-hour meter with an accuracy level of 0.05%. Adopting dual-core touch screen technology, automatic temperature balance technology and other compensation technologies, the index is stable, the function is rich, the interface is novel, the touch operation is clear and simple, the overall weight is light, the volume is small and the precision is high.

It can be widely used in electric energy metering industry, electric energy laboratory and other related departments, which can be used in laboratories and carried to work on site.

⚠**Note: In order to ensure the smooth progress of your work and the safety of you and the equipment you use, please read this manual carefully before using this product.**

➢ Chapter 2 Functional Characteristics

Touch screen	7-inch 800*480 dot matrix HMI color touch LCD display (capacitor)
Wide range measurement	Voltage: 30 ~ 600V Current: 10mA ~ 120A
Range switching	Manual or automatic
Multifunctional measurement	a) Basic measurement functions such as voltage, current, phase, frequency, active power, reactive power, apparent power factor and error corresponding to full wave, fundamental wave and harmonic wave b) Simultaneous measurement of voltage, current and power stability (up to 3 power stability algorithms) c) Vector diagram display, phase display mode: 0 ~ 360 d) Waveform display, harmonic analysis, distortion calculation, spectrum diagram display, which can display the amplitude, content and phase of harmonics e) 1-way pulse input port to measure the constant

	and frequency of the meter under inspection f) 2-way pulse output, constant types can be set: active, reactive, apparent, voltage, current, frequency
Electric energy error verification	It can check the estimated value of electric energy metering error and standard deviation of electric energy meter and electric energy meter verification device. Special compensation technology will not cause too much error jumping due to too small load (too low power pulse frequency) when the load is small. Can display the current error, standard deviation estimate value
Accumulation of electric energy	It can accumulate electric energy for a long time and compare it with the tested meter
Harmonic analysis	It can analyze harmonics of power frequency voltage and current with 51 times and below
Data and graphic display	It can visually display the measurement working state and various measurement data, as well as the waveform of measured voltage and current, the phase vector diagram of voltage and current, and the harmonic spectrum analysis diagram
Communication mode	Asynchronous communication is adopted, and baud rate can be selected
Chassis	Adopt standard portable aluminum chassis, which is small in size, light in weight and convenient to carry
Multi-purpose	It can be used as standard meter and tester of watt-hour meter verification device. It can be used alone, can also be used by remote control through communication with PC, and can also be used with verification device

➢ Chapter 3 Technical Introduction

1. Signal range

Voltage	10 ~ 600V
Current	1mA ~ 120A
Frequency	40 ~ 70Hz
Input pulse frequency	2MHz (TTL)
Output constant	Using automatic constant, output pulse frequency Fout: 25KHz at rated range

2. Accuracy

Measurement	Accuracy (PF ≥ 0. 5)
Voltage (RMS)	Sine wave: ± 0.05% RD (30V ~ 600V) ± 0.05% RG (10V ~ 30V), RG=30V 2-21 harmonics: ± 0.05% RD (30V ~ 600V) Distorted wave: ± 0.05% RD (30V ~ 600V)
Current (RMS)	Sine wave: ± 0.05% RD (10mA ~ 120A) ± 0.05% RG (1mA ~ 10mA), RG=10mA 2-21 harmonics: ± 0.05% RD (10mA ~ 120A) Distorted wave: ± 0.05% RD (10mA ~ 120A)
Active power	Sine wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A) 2-21 harmonics: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A) Fundamental wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A)
Active energy	Sine wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A) 2-21 harmonics: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A) Fundamental wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A)
Reactive power	Sine wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A)
Reactive power	Sine wave: ± 0.05% RD (30V ~ 600V, 10mA ~ 120A)
Frequency	Measurement range: 40 ~ 70Hz Resolution: 0.00001 Hz Accuracy: ± 0.005 Hz
Phase	Measurement range: 0 ~ 359.999 Resolution: 0.001 ® Accuracy: ± 0.02 ° (30V ~ 600V, 10mA ~ 120A)
Harmonic content Voltage	2 ~ 10 times: when the harmonic content is less than or equal to 30%; Error: ≤ 0.1% 11 ~ 21 times: when the harmonic content is less than or equal to 30%; Error: ≤ 0.2% 22 ~ 51 times: when the harmonic content is less than or equal to 30%; Error: ≤ 0.5%
Harmonic content Current	2 ~ 10 times: when the harmonic content is less than or equal to 50%; Error: ≤ 0.1% 11 ~ 21 times: when the harmonic content is less than or equal to 50%; Error: ≤ 0.2% 22 ~ 51 times: when the harmonic content is less than or equal to 50%; Error: ≤ 0.5%

3. Input impedance

Voltage	≥ 900 K Ω
Current	0.001 Ω

4. Working environment

Temperature	Normal temperature type: 15 ~ 30 ° C
Temperature coefficient	0.0005/° C
Preheating time	30 minutes
Wide temperature type	10 ~ 43 ° C temperature coefficient: 0.0002/° C; No preheating required
Verification temperature	23 ± 1 ° C
Humidity	45 ~ 80% R.H
Power supply	220V ± 10% 50Hz ± 1%
Power consumption	≤ 50VA

5. Others

Volume	450 × 130 × 400 mm
Weight	5 kg

➢ Chapter 4 Working Principle

CL-9560B single-phase multifunctional standard watt-hour meter adopts modular design, and the signal acquisition circuit converts the measured large voltage and large current signals into small voltage signals. After being processed, it is sent to AD sampling circuit. After being converted into digital signal by AD sampling circuit, it is sent to DSP for processing. After being processed by DSP, it is sent to arm main control board and displayed for processing. At the same time, arm main control board can control the bottom gear and the output state of equipment channel, and communicate with upper computer.

➢ Chapter 5 Structure and Wiring

1. Structure

Adopts luxury new aluminum chassis.

The front panel is equipped with a 7-inch touch color display (capacitor), as shown in Figure 5.1.1.

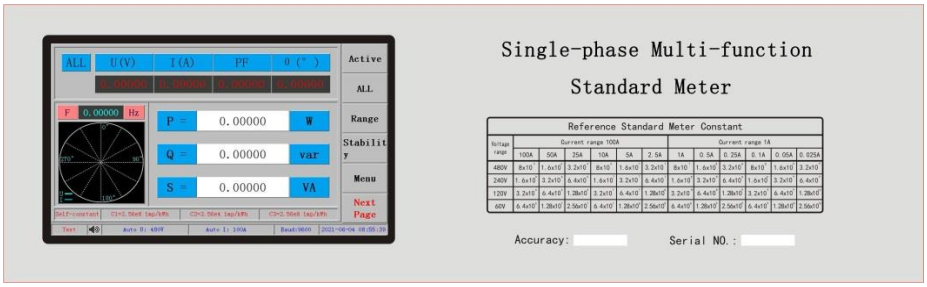

Figure 5.1.1 Front Panel

Layout of rear panel: power socket, switch and various terminals, see Figure 5.1.2.

The universal serial communication port conforms to RS-232 standard.

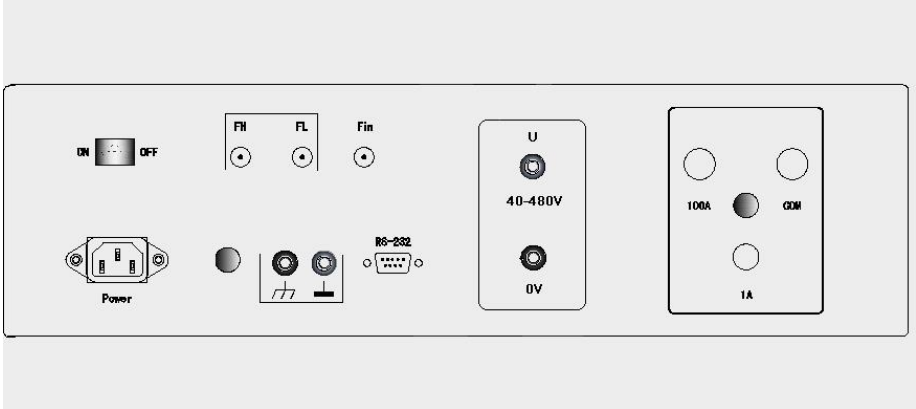

Figure 5.1.2 Rear Panel

2. Wiring

a) Connect 220V mains power to the power supply socket;

b) The measured voltage and current signals are connected to the corresponding terminals of the back panel according to the phase sequence;

c) If the watt-hour meter or calibration device is detected, the current line of the watt-hour meter or calibration device is connected with the instrument according to the phase sequence. Voltage lines are connected in parallel with this instrument in phase sequence. The

output power pulse signal of the tested meter or device is connected with the Fin interface of the instrument;

d) If the instrument is verified, the current line of the verification device is connected with the instrument, the voltage line is connected with the instrument, and the power pulse output FH or FL of the instrument is connected with the pulse input port Fin interface of the verification device;

e) The grounding terminal of the casing should be connected with PE protection line of user power supply system;

⚠**Note: The range of access to each signal must comply with the provisions in "Chapter 3 Technical Introduction" of this specification.**

➢ Chapter 6 Operation Methods

1. Turn on

a) Check the wiring;

b) After confirming that the wiring is correct, turn on the power switch on the back panel of the instrument. After hearing the "beep" sound, the display will light up and display the picture as shown in Figure 6.1. 1. Indicate that the power supply is normal;

c) After Loading is finished, the system starts up, and the default is the electricity analysis interface, and the default range is automatic mode;

Figure 6.1.1 Boot interface

2. Shut down

a) The measurement signal input is zero;

b) After confirming that the input signal is zero, turn off the power switch;

⚠**Note: Before adding the current measurement signal, the instrument must enter the working state, otherwise it will cause the current source alarm.**

3. Touch control area and instrument information bar

There is a touch control area on the right side of all interfaces, and another touch control area is added to the special interface, which will be explained separately in the figure. Generally, the red area ① in Figure 6.3. 1 is the navigation touch area.

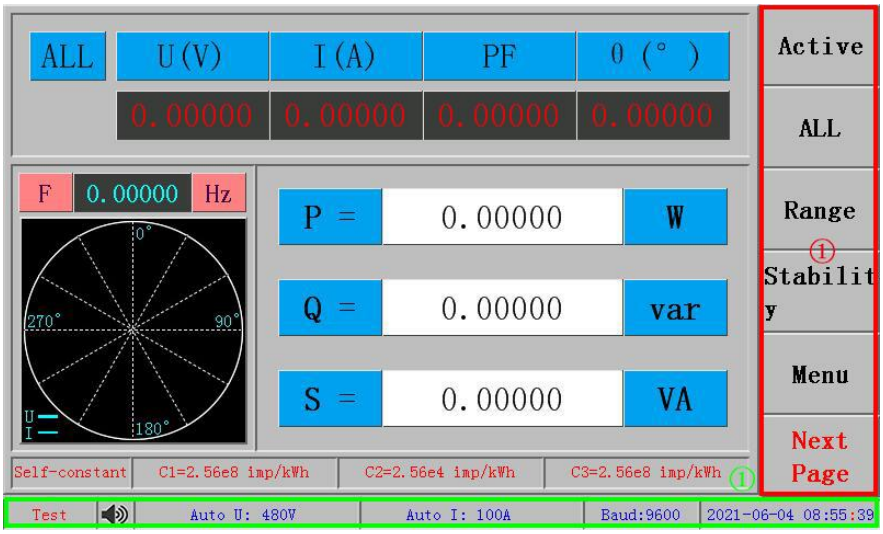

Figure 6.3.1 Navigation Touch Area Indication

Instrument information column (green area ①):

① Measurement and analysis: indicates that it is currently a measurement and analysis interface;

② Indicates that the buzzer is on;

③ Automatic U: 60V: indicates the current voltage range state of the instrument;

④ Automatic I: 2.5A: indicates the current range state of the instrument;

⑤ Baud: 9600: Indicates the current communication baud rate of the instrument;

⑥ 2021-05-12 11:16:34: indicates the current time;

4. Touch keyboard operation

Touching some touch keys will call the touch keyboard, as shown in Figure 6.4. 1.

Figure 6.4.1 Touch keyboard

a) CLR: Clear key to clear all input values;

b) DEL: Delete key to delete the last input value;

c) OK: OK key;

d) .: The decimal point key;

e) -: minus sign bond;

f) Others are numeric keys;

5. Menu interface

Select "Menu" in the navigation touch area to enter the page, as shown in Figure 6.5.1.

Figure 6.5.1 Menu

The functions of each button in the screen are as follows. Touch the corresponding button to enter the corresponding interface:

a) Electricity analysis: routine measurement interface, displaying all measured values, vector diagrams, etc.;

b) Waveform Harmonic: Harmonic analysis interface, display voltage, current waveform, distortion, harmonic analysis;

c) Error calibration: Error calibration interface, which can calibrate the estimated value of electric energy metering error and standard deviation of electric energy meter and electric energy meter verification device;

d) Stability: Stability analysis interface, which can analyze voltage, current and power stability;

e) Constant test: Constant test interface, which can test the constants of the tested table;

f) Electric energy accumulation: Electric energy accumulation interface, which can accumulate electric energy for a long time and compare it with the tested table;

g) Gear setting: Gear setting interface, which can set voltage and current gears respectively;

h) Channel setting: Channel setting interface, which can set the pulse output state of two pulse channels respectively;

i) Instrument setting: instrument setting interface, which can set relevant parameters when the instrument works;

j) Instrument calibration: Instrument calibration interface, can be recalibrated to the instrument, enter the interface, need a password, generally not open to users;

k) System help: System help interface, showing the instrument name,

accuracy, serial number, software version number, etc.;

6. Electricity analysis

Enter the interface by default when you start up. You can press "Electricity Analysis" in the menu interface or select "Electricity" in the navigation touch area to enter the page, as shown in Figure 6.6. 1.

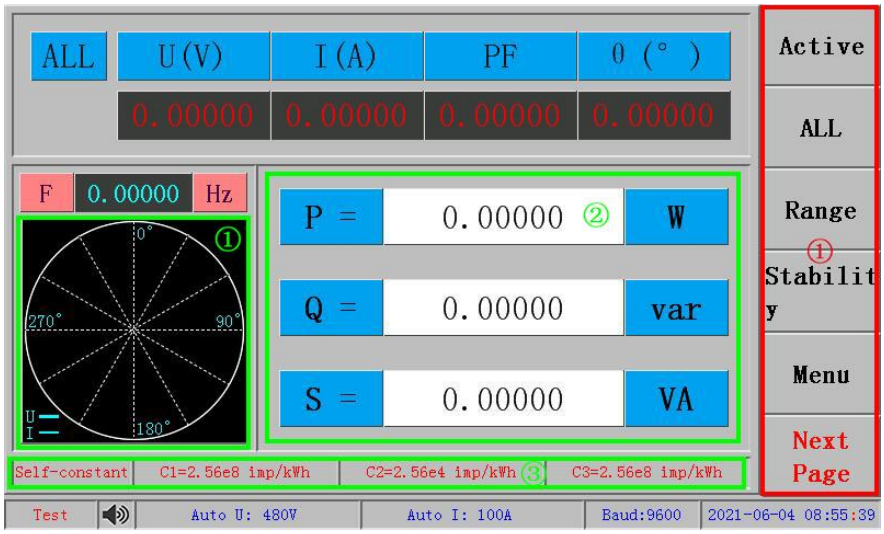

Figure 6.6.1 Electricity Analysis

a) The red touch area ① in the figure is the navigation touch area, in which there are 6 touch keys with the following functions:

① Active: Instrument measurement mode touch key, can be switched to "active", "natural reactive", "apparent";

② Full-wave: The instrument measurement mode touch key can be switched to "full-wave", "fundamental wave" and "harmonic wave";

③ Gear: Press this key to enter the gear setting interface, as shown in Figure 6.9. 1;

④ Stability: Press this key to enter the stability analysis interface, as shown in Figure 6.7. 1;

⑤ Menu: Press this key to enter the menu interface, as shown in

Figure 6.5. 1;

⑥ Next page: Touch this key to enter the touch area of the next page, which are "Waveform", "Error", "Constant Test", "Electric Energy Accumulation", "Menu" and "Previous Page";

b) The green area ① in the picture is a vector picture;

c) The green area ② in the figure is active, reactive and apparent power;

d) The green area ③ in the figure is the constant in this table, where C1 and C2 respectively represent the output constants of pulse output ports FH and FL of the instrument; The unit represents the data type of the output constant;

① imp/kWh: Active energy constant;

② imp/kvarh: Reactive energy constant;

③ imp/kVAh: Apparent electrical energy constant;

④ imp/kVh: Voltage constant;

⑤ imp/kAh: Current constant;

⑥ imp/kHzh: Frequency constant;

e) Other display areas in the figure are the same as above;

7. Stability

Press "Stability" in the menu interface or touch in the power analysis touch area ② to enter the stability analysis interface, as shown in Figure 6.7. 1.

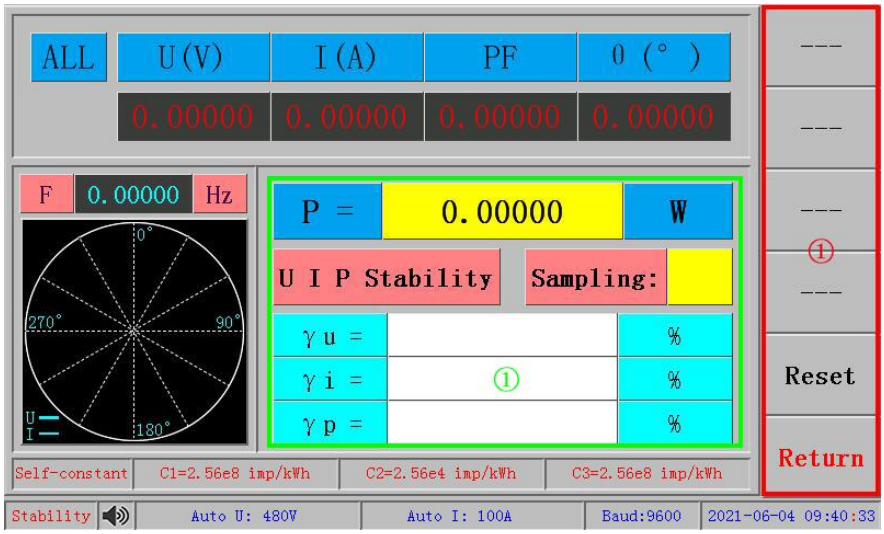

Figure 6.7.1 Stability analysis

a) The red touch area ① in the figure is the navigation touch area, in which two touch keys have the following functions:

① Start-up: stability recalculation;

② Return: You can switch to the electricity analysis interface;

b) The green area ① in the figure is the stability display area;

① γ u: voltage stability;

② γ i: current stability;

③ γ p: power stability;

c) Other display areas in the diagram are the same as those described in (6. Electricity analysis);

8. Harmonic analysis

You can enter by pressing "Waveform Harmonic" in the menu interface or selecting "Waveform" in the navigation touch area Analyze the interface, as shown in Figure 6.8. 1.

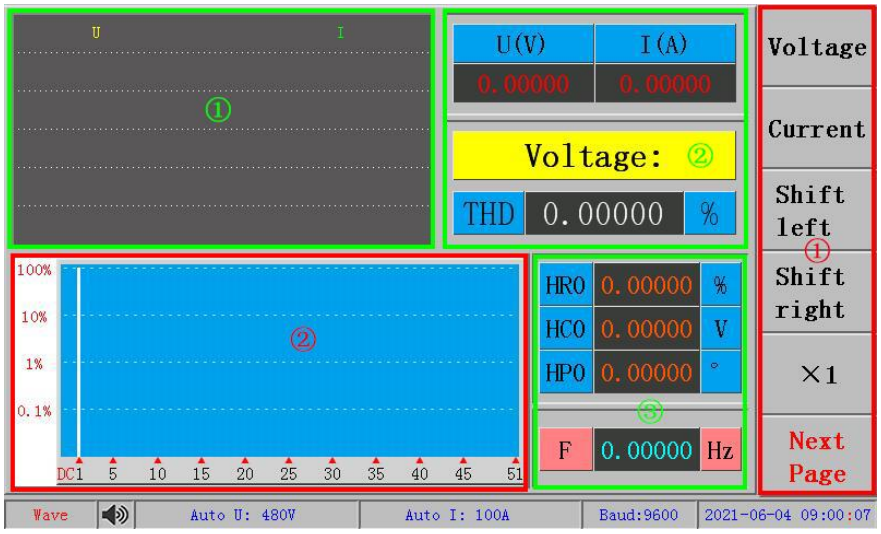

Figure 6.8.1 Harmonic analysis

a) The red touch area ① in the figure is the navigation touch area, in which there are 6 touch keys with the following functions:

① Voltage: Current harmonic analysis type, switch to "voltage" state by touching;

② Current: Current harmonic analysis type, touch and switch to "current" state;

③ Left shift: the number of current harmonic correspondence analysis is reduced by one;

④ Right shift: the number of current harmonic correspondence analysis plus one;

⑤ × 1: Set harmonic page turning step, which can be switched to "× 1" and "× 10";

⑥ Next page: Touch this key to enter the touch area of the next page, which are "Power", "Error", "Gear", "Menu" and "Previous

Page";

b) The red touch area ② in the figure is the 51st harmonic spectrum analysis diagram, and the total harmonic analysis interface can be entered by touching here at the same time, as shown in Figure 6.8. 2;

c) The green area ① in the figure is the waveform analysis diagram corresponding to the current setting;

d) The green area ② in the figure is the distortion (THD) of the phase corresponding to the measured values of voltage and current and the current setting type;

e) The green area ③ in the figure is the harmonic content (HRx), harmonic value (HCx) and harmonic initial phase angle (HPx) corresponding to the harmonic times of all corresponding phases of the current setting type;

f) Other display areas in the figure are the same as those described in (5. Electricity analysis);

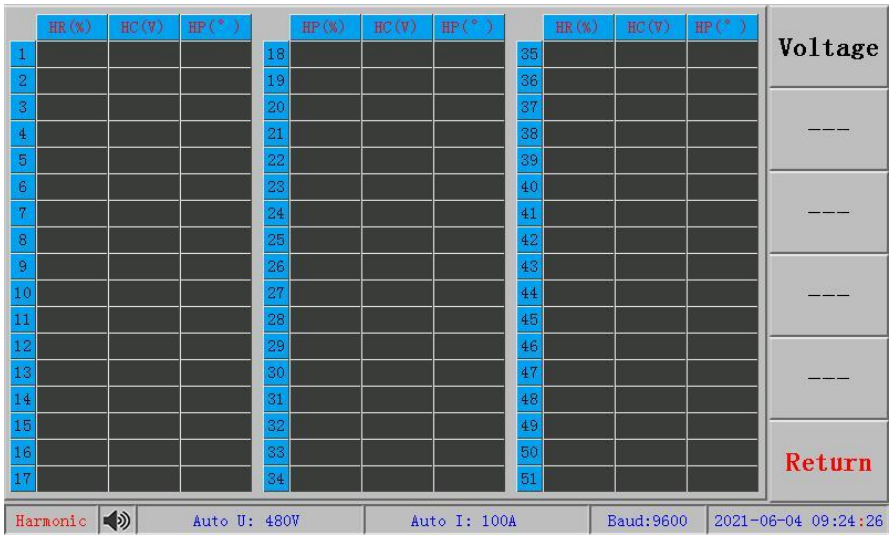

Figure 6.8.2 Total Harmonic Analysis

a) The red touch area ① in the figure is the navigation touch area, in which three touch keys have the following functions:

① Voltage: Current harmonic analysis type, which can be switched

to "voltage" or "current";

② Return: Touch "Return" to switch to harmonic analysis interface;

b) The green area ① in the figure is the harmonic content (HRx), harmonic value (HCx) and harmonic initial phase angle (HPx) corresponding to the 51 harmonic times of all corresponding phases of the current setting type;

c) Other display areas in the figure are the same as those described in (6. Electricity analysis);

9. Gear setting

Press "Gear Setting" in the menu interface or select "Gear" in the navigation touch area to enter the gear setting interface, as shown in Figure 6.9. 1.

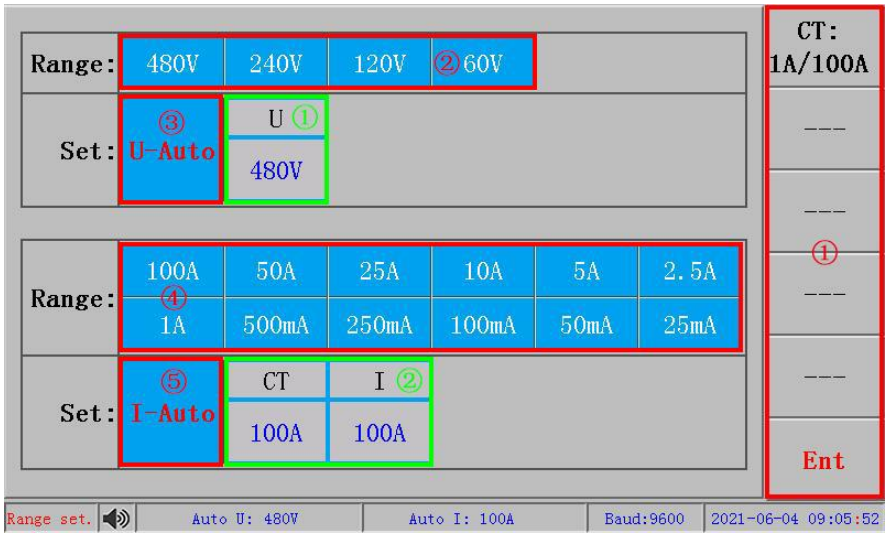

Figure 6.9.1 Gear setting

a) The red touch area ① in the figure is the navigation touch area, in which three touch keys have the following functions:

① CT: 1A/100A: Instrument current input terminal, CT in white box is set corresponding to current gear, 100A means 100A terminal input, 1A means 1A terminal input, in which 1A terminal input

cannot exceed 1.25 A, otherwise the corresponding phase fuse will be burned;

② OK: Touch this key to return to the previously displayed page;

b) The red touch area ② in the figure is the voltage gear selection area, and the optimal gear can be selected;

c) The red touch area ③ in the figure is voltage mode, which can be selected as "automatic" and "manual" mode;

d) The red touch area ④ in the figure is the current gear selection area, and the optimal gear can be selected;

e) The red touch area ⑤ in the figure is current mode, which can be selected as "automatic" and "manual" mode;

f) The green area ① in the figure shows the current voltage gear;

g) The green area ② in the figure is displayed for the current current gear and current input terminal;

h) Other display areas in the figure are the same as those described in (6. Electricity analysis);

10. Channel setting

Press "Channel Settings" in the menu interface to enter the Channel Settings interface, as shown in Figure 6.10.1.

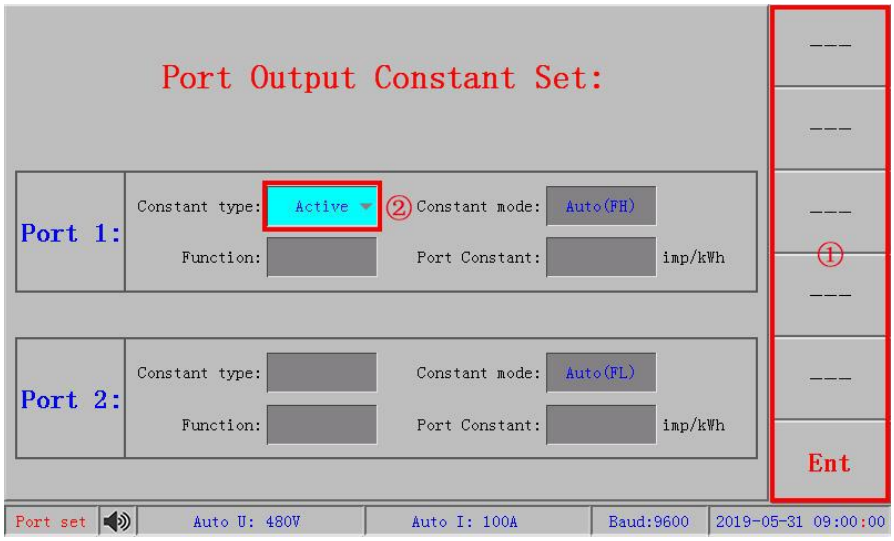

Figure 6.101 Channel Settings

a) The red touch area ① in the figure is the navigation touch area, and its function is the same as that described in (6. Electricity analysis);

b) The red touch area ② in the figure is a constant type selection, and the pulses of each output channel can be set as active,

Reactive power, apparent power, voltage, current and frequency;

c) Channel function: not used in single phase;

d) Constant mode: By default, channel 1 outputs high-frequency pulses and channel 2 outputs low-frequency pulses;

e) Channel constant: the constant value corresponding to the current gear of the instrument;

11. Error check

Press "Error Check" in the menu interface to enter the error check interface, as shown in Figure 6.11. 1.

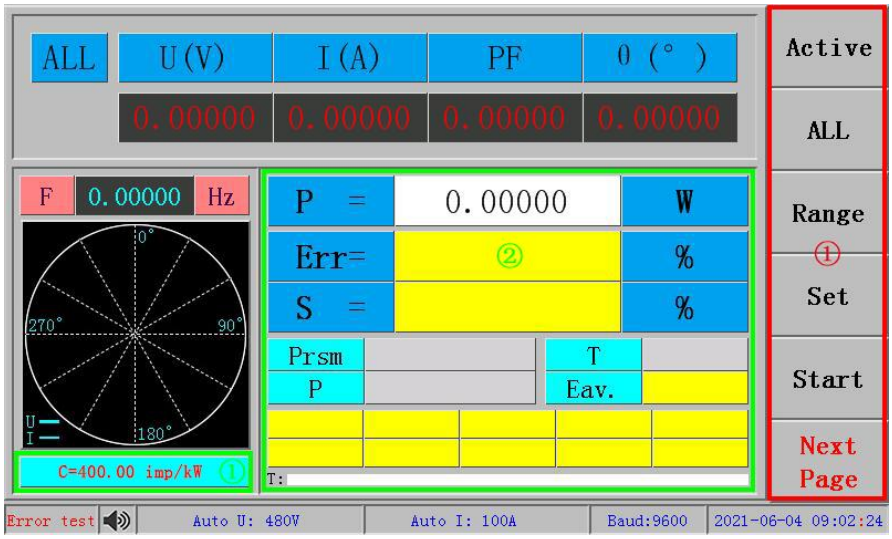

Figure 6.11.1 Error check

a) The red touch area ① in the figure is the navigation touch area, in which there are 6 touch keys with the following functions:

① Parameters: Press this key to enter the error parameter setting interface (Figure 6.11. 2), and set error parameters;

② Start: Indicates the error start or stop, which can be switched to "start" and "stop";

③ Active, full wave, gear, next page: the same as (6. Electricity analysis);

b) The green area ① in the figure is the current error display area, and the functions of each phase are as follows:

① Err: Current error value;

② S: Standard deviation;

③ Prsm: Theoretical pulse number of standard table;

④ P: Actual pulse number of standard table;

⑤ T: The number of bezels to be checked;

⑥ Eav.: Average error value;

⑦ The yellow area is the error storage area;

c) The green area ② in the figure is the constant of the tested table;

d) Other display areas in the figure are the same as those described in (6. Electricity analysis);

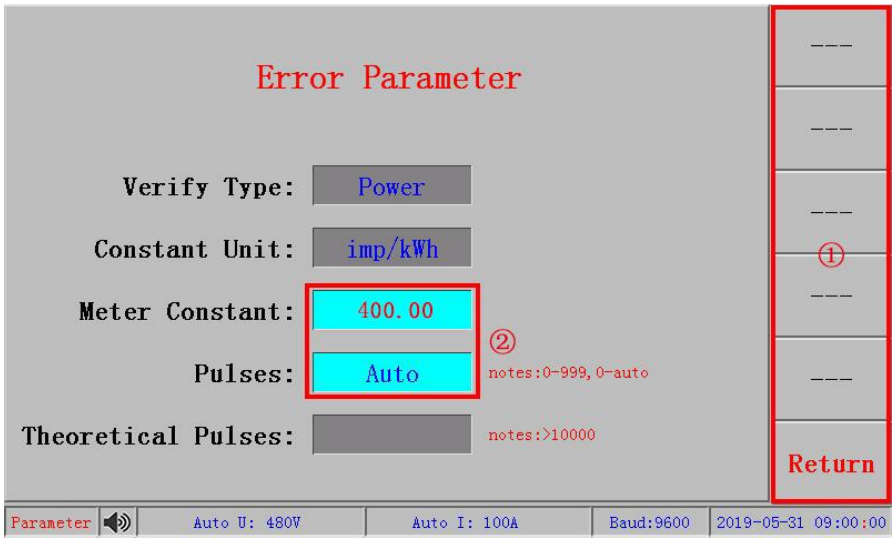

Figure 6.11.2 Setting of error parameters

e) The red touch area ① in the figure is the navigation touch area, and pressing "Return" can switch to the error verification interface;

f) The red touch area ② in the figure is the parameter setting area, which can be set correspondingly by touching the corresponding key;

g) Theoretical pulse number = standard table constant × number of turns ÷ corrected table constant;

12. Constant test

Press "Constant Test" in the menu interface or select "Constant Test" in the navigation touch area to enter the constant test interface, as shown in Figure 6.12. 1.

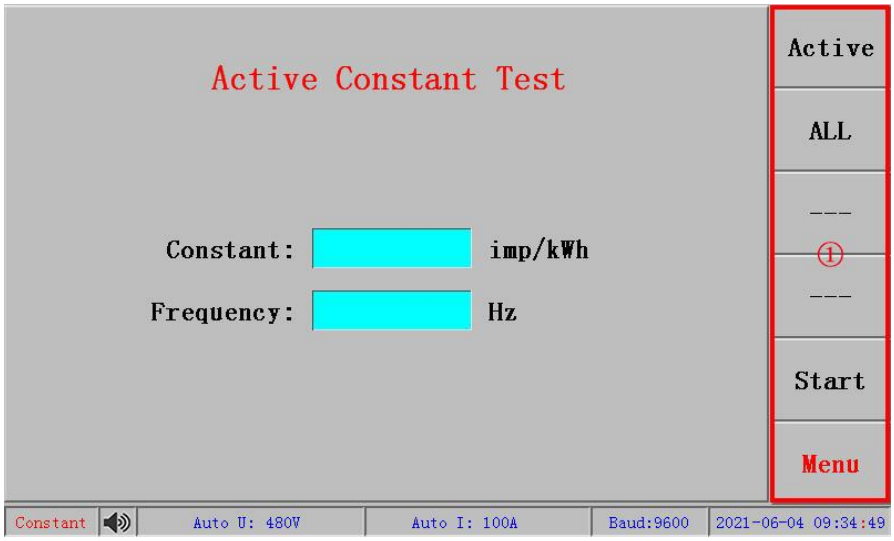

Figure 6.12.1 Constant test

a) The red touch area ① in the figure is the navigation touch area, in which five touch keys have the following functions:

① Start: Indicates the start or stop of constant test, which can be switched to "start" and "stop";

② Active, full wave, menu: the same as (6. Electricity analysis);

13. Accumulation of electric energy

Press "Electric Energy Accumulation" in the menu interface or select "Electric Energy Accumulation" in the navigation touch area to enter the electric energy accumulation interface, as shown in Figure 6.13.1.

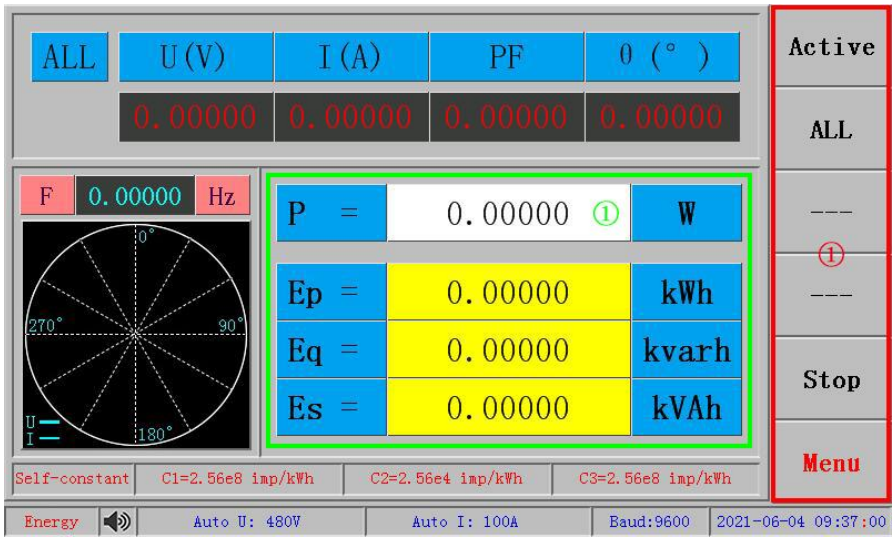

Figure 6.13.1 Accumulation of electric energy

a) The red touch area ① in the figure is the navigation touch area, in which five touch keys have the following functions:

   ① Stop: Indicates the start or stop of electric energy accumulation, which can be switched to "start" and "stop";

   ② Active, full wave, menu: the same as (5. Electricity analysis);

b) The green area ① in the figure is the current electric energy accumulation area, and the functions of each phase are as follows:

   ① Ep: Active power;

   ② EQ: Reactive power;

   ③ Es: Apparent electric energy;

c) Other display areas in the figure are the same as those described in (6. Electricity analysis);

14. Instrument setting

Press "Instrument Settings" in the menu interface to enter the Instrument Settings interface, as shown in Figure 6.14. 1.

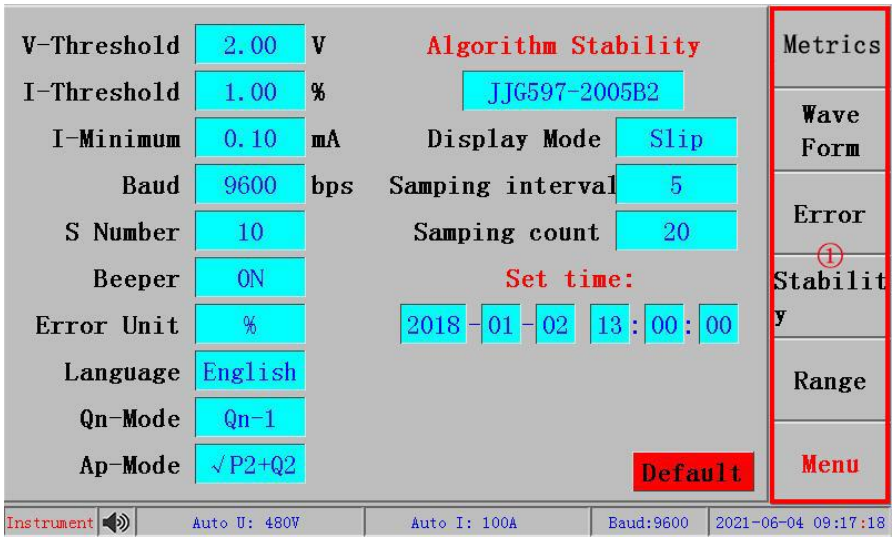

Figure 6.14.1 Instrument setup

a) The red touch area ① in the figure is the navigation touch area, and its function is the same as that described in (6. Electricity analysis);

b) All light blue is the corresponding touch key, and the function description is as follows;

① Voltage threshold: minimum measured voltage value;

② Current Threshold: the minimum current value that can be measured in all current gears;

③ Bottom current: The standard meter can measure the bottom current value;

④ Baud rate: Baud rate of communication between standard table and external equipment;

⑤ Number of standard deviation: the number of times to calculate the standard deviation;

⑥ Buzzer sound: "on"/"off" corresponds to the key tone opening and closing respectively;

⑦ Error unit: When error is checked, it is calculated as% for display;

⑧ Language selection: It can be set to "Chinese" and "English"

status;

⑨ Reactive power measurement: Reactive power calculation method, reactive power 1, 2 and 3 correspond to "90 phase shift", "Integration" and "Shelbert" respectively;

⑩ Apparent power: Apparent power calculation method;

⑪ Stability algorithm: Stability calculation method;;

⑫ Time setting: Standard table time can be set;

15. Instrument calibration

Press "Instrument Calibration" in the menu interface to enter the instrument calibration password input interface. If the password is entered correctly, enter the instrument calibration interface, and manually operate the corresponding gear coefficients of the calibration standard table, which is generally closed to the outside world.

16. System help

Press "System Help" in the menu interface to enter the system help interface, as shown in Figure 6.16.1.

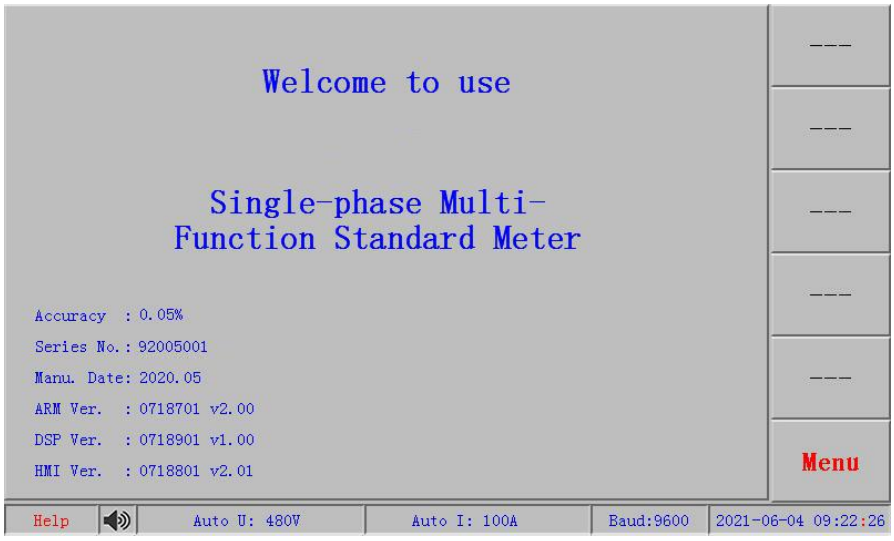

Figure 6.16.1 System Help

➢ Chapter 7 High Frequency Pulse Constant Table

1. Output pulse frequency:

   FH=CH*P/3600 (Hz)

   FL=FH/10000 (Hz)

2. Output level: TTL level

3. The high frequency pulse constants are as follows: CH (imp/kwh, imp/kvarh, imp/kVAh)

	100A	50A	25A	10A	5A	2.5A
480V	8×10^5	1.6×10^6	3.2×10^6	8×10^6	1.6×10^7	3.2×10^7
240V	1.6×10^6	3.2×10^6	6.4×10^6	1.6×10^7	3.2×10^7	6.4×10^7
120V	3.2×10^6	6.4×10^6	1.28×10^7	3.2×10^7	6.4×10^7	1.28×10^8
60V	6.4×10^6	1.28×10^7	2.56×10^7	6.4×10^7	1.28×10^8	2.56×10^8

	1A	500mA	250mA	100mA	50mA	25mA
480V	8×10^7	1.6×10^8	3.2×10^8	8×10^8	1.6×10^9	3.2×10^9
240V	1.6×10^8	3.2×10^8	6.4×10^8	1.6×10^9	3.2×10^9	6.4×10^9
120V	3.2×10^8	6.4×10^8	1.28×10^9	3.2×10^9	6.4×10^9	1.28×10^{10}
60V	6.4×10^8	1.28×10^9	2.56×10^9	6.4×10^9	1.28×10^{10}	2.56×10^{10}

4. Voltage high frequency pulse constants are as follows: CH (imp/kVh)

480V	240V	120V	60V
1.8×10^8	3.6×10^8	7.2×10^8	1.44×10^9

5. The current high frequency pulse constant is as follows: CH (imp/kAh)

100A	50A	25A	10A	5A	2.5A
8.64×10^{8}	1.728×10^{9}	3.456×10^{9}	8.64×10^{9}	1.728×10^{10}	3.456×10^{10}
1A	500mA	250mA	100mA	50mA	25mA
8.64×10^{10}	1.728×10^{11}	3.456×10^{11}	8.64×10^{11}	1.728×10^{12}	3.456×10^{12}

6. Frequency high frequency pulse constant CH (imp/kHzh)

CH=1. 44 × 109imp/kHzh

➢ Chapter 8 Communication Notes

1. Serial port parameters

RS232 communication interface is adopted.

When serial asynchronous communication interface is adopted, serial data is based on bytes, with 8 data bits, 1 stop bit and no parity bit.

When serial communication is adopted, the baud rate of communication can be selected: 2400, 9600, 19200 and 115200.

2. Communication format

Each communication instruction sent by the host computer to the instrument consists of three parts: instruction characters, parameters and end marks, in which the instruction characters and parameters are ASC codes and the end marks are 0D in hexadecimal.

The instrument has return information for each instruction, and the format of return information is also composed of three parts: return flag character, parameter and end flag, in which the return flag character and parameter are ASC code, and the end flag is hexadecimal 3B.

3. Voltage range setting

	Instruction character	Parameter	End sign
Send	UB	X	0D
Echo	UBACK	None	3B
Parameter X	0-480V 1-240V 2-120V 3-60V		

4. Current range setting

	Instruction character	Parameter	End sign
Send	IB	0X	0D
Echo	IBACK	None	3B
Parameter X	0-100A 1-50A 2-25A 3-10A 4-5A 5-2.5 A 6-1A 7-500mA 8-250mA 9-100mA A-50mA B-25mA		

5. Measurement mode setting

	Instruction character	Parameter	End sign
Send	MS	X	0D
Echo	MSACK	None	3B
Parameter X	0-single-phase active 1-single-phase reactive 2-single-phase apparent		

6. Channel 1 Output Constant Setting (Fixed High Frequency Output)

	Instruction character	Parameter	End sign
Send	P1	A, B, C, D	0D
Echo	P1ACK	None	3B
Parameter a (Constant type)	0-Active Power 1-Reactive Power 2-Apparent Power 3-Voltage 4-Current 5-Frequency		
Parameter b (Channel functionality)	This function is not available for single phase, and it can be set to 0		

Parameter c (Constant Mode)	0-Automatic Constant 1-Manual Constant Note: Temporary setting is invalid
Parameter d (Channel constant)	Science and technology law means: Xxxxxxxyy X-integer bit xxxxxxx-decimal part yy-exponent Note: Temporary setting is invalid

7. Measurement data and instrument status query

	Instruction character	Parameter	End sign
Send	DT	0	0D
Echo	S	Measurement data and instrument status	3B

Note: Parameter description

There are 31 parameters, and each parameter consists of flag characters and data. The specific contents are as follows:

Mark character ASC code	Data ASC code	Unit	Data meaning	Parameter type
A	XXXXXXXXX	V	Voltage	Measurement
B	0000000000			Measurement
C	0000000000			Measurement
D	XXXXXXXXX	A (mA)	Current	Measurement
E	0000000000			Measurement
F	0000000000			Measurement
G	XXXXXXXXX	W	Active power	Measurement
H	XXXXXXXXX	VA	Apparent power	Measurement
I	XXXXXXXXX	Var	Reactive power	Measurement
J	XXXXXXXXX		Power factor	Measurement
K	XXXXXXXXX	° (degree)	Equivalent angle	Measurement
L	XXXXXXXXX	Hz	Frequency	Measurement
M	X		Voltage range	Instrument
N	X		Current range	Instrument
O	X		Measurement	Instrument

Parameter data whose parameter type is measurement data is 10 characters long. If the measured data is regular data format: the first six bits are integer

parts, and the last four bits are decimal parts, for example, the measured data is 0002208888 for 220.8888, and the measured data is 0000000888 for 0.0888. If the measurement data is negative, the data format is: there is an n before the significant bit to represent a negative sign, the first six bits are integer parts, and the last four bits are decimal parts, for example, the measurement data is 00n2208888 to represent-220.8888, the measurement data is 0n22008888 to represent-2200.8888, the measurement data is 0000n00888 to represent-0.0888, and the measurement data is 0000n08888 to represent-0.8888 (that is, if the measurement data is negative and decimal, the n is in the fifth place).

Parameter type for the state of the meter parameter data length of 1 character, representing a BCD code, the specific content of the same as send command parameters.

➢ Chapter 9 Instrument Matching

1. Single-phase multifunctional standard watt-hour meter
2. 1 copy of product certificate
3. 1 copy of instruction manual
4. Packing list 1 copy
5. 1 power cord
6. One spare fuse tube (1A) for power supply (attached to fuse holder)