



National High-Tech Enterprises Zhejiang Province

C-Lin 欣灵

使用手册
Products Instructions

产品合格证



符合标准: GB/T 22264

检验员: 检-01

出厂日期: 见产品或盒贴出厂编号

本产品经检验合格,准予出厂。

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XINLING ELECTRICAL CO., LTD.

C-Lin®

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RECYCLABLE

HPZ Series

Programmable Three-Phase Power Meter

Thank you very much for using Xinling brand instruments and meters. Please read the user manual before using the product.

09A05200

I. Performance Overview

1. The HPZ series programmable three-phase power meter can perform real-time measurement of three-phase voltage and three-phase current in power lines. By installing different functional modules, it can realize functions such as switch input, switch output, analog transmission, and RS485 communication.
2. The meter features 4-digit display with a precision of 0.5 class.
3. It adopts the standard Modbus-RTU communication protocol.
4. Users can set relay alarm parameters, transmission output parameters, and communication parameters via buttons.

II. Main Technical Specifications

1. Input Signals

- ◆ Current signal: AC current 0-5A direct connection; continuous operation: 1.2x rated value; instantaneous: 10x rated value for 1 second
- ◆ Voltage signal: AC voltage 0-500V direct connection; continuous operation: 1.2x rated value; instantaneous: 2x rated value for 1 second
- Frequency: 40-60Hz
- Input impedance: Voltage meter > 500k Ω ; current meter < 2m Ω

2. Measurement & Display

- ◆ Display range: 0-9999
- ◆ Precision: 0.5 class
- ◆ Resolution: 0.1 (for voltage); 0.001 (for current)

3. Output Functions

- ◆ Switch output: Relay contact output; contact capacity: AC220V, 3A (resistive)
- ◆ Analog output: DC4-20mA, DC0-20mA, DC0-10mA

4. Other Functions

- ◆ Power supply: AC220V \pm 10%, 50Hz (custom special power supply is available); power consumption 3VA.
- ◆ Insulation resistance: 100M Ω ; Withstand voltage: 2KV/1min (AC RMS value).
- ◆ Operating conditions: Temperature: -10-50 $^{\circ}$ C; Relative humidity: 90% (in an environment free of corrosive gases).

III. Naming Rules (Please use the following code to confirm whether the product delivered by our company matches the function you selected)

Product code: HPZ / /

1 2 3 4 5

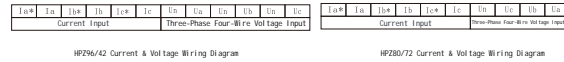
Power Meter

1. Outline Dimension Code Unit (mm)

| Product Code | Front Frame Dimension | Mounting Hole Dimension |
|--------------|-----------------------|-------------------------|
| HPZ96 | 96×96 | 91×91 |
| HPZ42 | 123×123 | 112×112 |
| HPZ80 | 84×84 | 76×76 |
| HPZ72 | 75×75 | 68×68 |

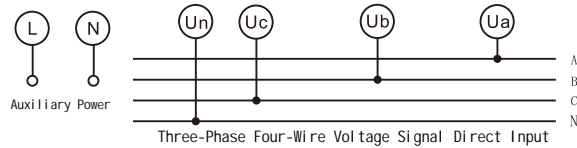
- 2. Combination Codes 3A = Three-phase Ammeter 3V = Three-phase Voltmeter 3AV = Three-phase Current-Voltage Combination Meter
- 3. Function Module J = Two-way Switch Contact Output
- 4. Function Module M = One-way Analog Transmitter Output
- 5. Function Module C4 = RS485 Communication Output

IV. Terminal Function Configuration

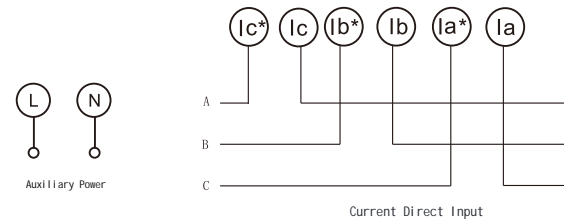
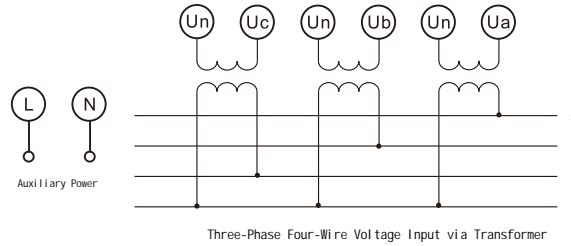
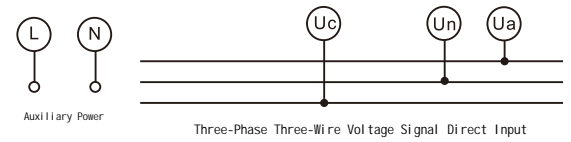


Note: The wiring diagram shown above is a comprehensive wiring diagram for full functions (current, voltage, communication). If the meter you purchased is HPZ96-3A, you only need to connect the current input terminals—this model does not support communication or voltage input functions.

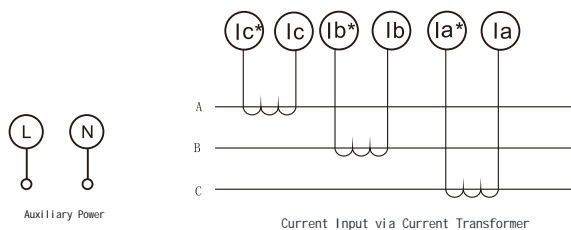
V. Typical Wiring & Precautions (The symbol " " in the diagram represents a transformer)



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1. Auxiliary Power

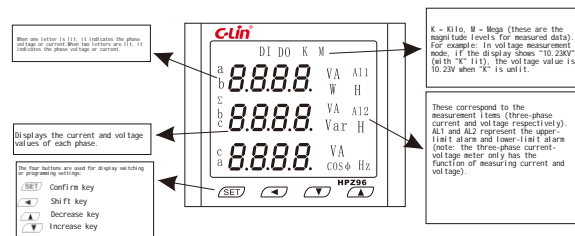
The meter requires an external auxiliary power supply to operate normally. Ensure the power supply provided is compatible with the meter to avoid damage.

2. Signal Input

Input voltage must not exceed the product's maximum input voltage (600V); otherwise, a voltage transformer (PT) should be used. Input current must not exceed the product's maximum input current (6A); otherwise, a current transformer (CT) should be used.

VI. Operation Instructions

1. Panel Description



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2. Menu Character Description

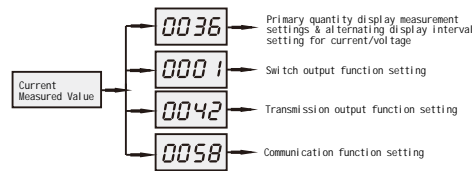
| Parameter Symbol | Parameter Code | Factory Default Value | | |
|------------------|----------------|--|---------|--------|
| | | Current | Voltage | |
| HALr | HALr | Primary quantity upper-limit alarm value setting | 4.00 | 400.0 |
| H-Hc | H-Hc | Primary quantity upper-limit alarm hysteresis | 0.005 | 000.5 |
| LALr | LALr | Primary quantity lower-limit alarm value setting | 1.000 | 100.0 |
| L-Hc | L-Hc | Primary quantity lower-limit alarm hysteresis | 0.005 | 000.5 |
| Jt in | Jtim | Relay alarm delay time | 000.0 | 000.0 |
| Ion | Ion | Current transmission object selection | 0001 | 0001 |
| obty | obty | Transmission output type | 4-20mA | 4-20mA |
| obl | obl | Display value corresponding to low end of quantity transmission | 0.000 | 0000 |
| obH | obH | Display value corresponding to high end of quantity transmission | 5.000 | 500.0 |
| Addr | Addr | Meter communication address | 0001 | 0001 |
| bAud | bAud | Meter communication baud rate | 9600 | 9600 |
| conn | conn | Meter communication check bit setting | nonE | nonE |
| disA | disA | Primary current display value | 0005 | 0000 |
| disU | disU | Primary voltage display value | 0000 | 0000 |
| time | time | Alternating display interval for current & voltage | 005.0s | 005.0s |

Note: Switch output and analog transmission functions are only applicable to HP242 and HP296 models.
(The three-phase current-voltage combination meter does not support switch output or analog transmission functions.)

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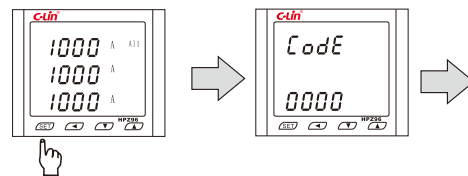
3. Operation Procedure

(1) Password Preset for Viewing or Modifying the Meter



(2) Set the Primary Quantity Display Value of the HPZ96-3A Three-Phase Ammeter

Example: Change the primary display current value of the HPZ96-3A three-phase ammeter from 1000/5A to 2000/5A.

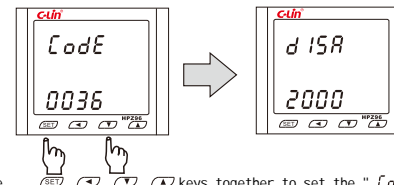


Operation steps shown in the diagram :

a) In the normal display state, press the "SET" key once to enter the password preset state.

Notes: ① When pressing the "SET" key, a short press (light tap) is sufficient—do not press and hold.
② The menu labeled "Code" corresponds to the password preset function.

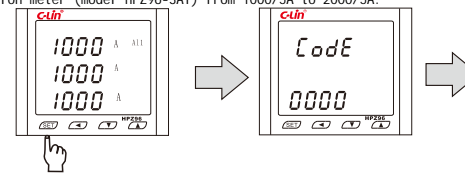
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b) Use the keys together to set the "Code" menu to "0036". Then press the "SET" key once to enter the "d15a" setting interface.

c) Use the keys together to set the "d15a" menu to "2000". Then press and hold the "SET" key for 3 seconds—the meter will save the settings and return to the measurement interface.

Notes: ① The password "0036" is the access code for the meter's quantity setting function.
② The "d15a" menu corresponds to the primary current display value.
③ For the "SET" function key: press and hold it for more than 3 seconds, and the meter will save the modifications and return to the measurement interface.
(3) Set the primary current display value of the three-phase current combination meter (model HPZ96-3AY) from 1000/5A to 2000/5A.

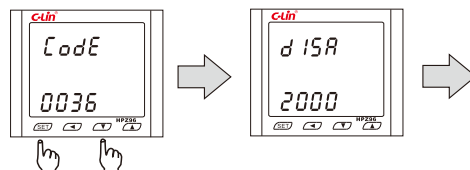


Operation Steps:

a) In the normal display interface, press the "SET" key lightly once to enter the password preset state. a) In the normal display interface, press the "SET" key lightly once to enter the password preset state.

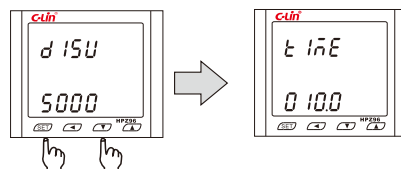
Note: ① When pressing the "SET" key, a short light press is sufficient—do not press and hold it.
② The menu labeled "Code" corresponds to the password preset function.

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- b) Then, use the SET key in combination with the directional keys (← → ↻) to set the menu item "CodE" to "0036". Then press the "SET" key once to enter the "dISA" setting interface.
- c) Then, use the SET key together with the directional keys (← → ↻) to set the menu item "dISA" to "2000". Then press the "SET" key once to enter the "dISU" setting interface.

Notes: The password "0036" is the access code for setting the primary electrical quantity parameters of the meter.
The menu item "dISA" corresponds to the primary current display value.
The menu item "dISU" corresponds to the primary voltage display value.



- d) Then, use the SET key together with the directional keys (← → ↻) to set the menu item "dISU" to "5000". Then press the "SET" key once to enter the "tInE" setting modification interface.
- e) Then, use the SET key together with the directional keys (← → ↻) to set the menu item "tInE" to "010.0". Then press and hold the "SET" key for 3 seconds – the meter will save the changes and return to the measurement interface.

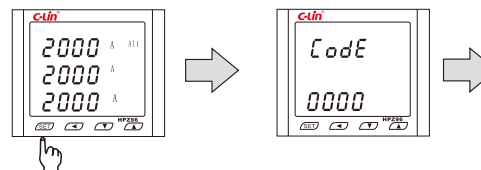
Note: The menu item "tInE" refers to the interval time for alternating display of current and voltage. The "tInE" menu is only available on three-phase combined current and voltage meters.

(4) Configure the Digital Output Function of HPZ96-3A-J
Example: A system uses the HPZ96-3A-J 2000/5A three-phase ammeter to monitor the real-time current value of a three-phase motor during operation. The requirement is: trigger an alarm when the current of any phase exceeds 1500A; deactivate the alarm signal only when the currents of all three phases drop back to 1480A. If the motor operates below the rated voltage due to an abnormality, the current of a certain phase will drop below 1300A.

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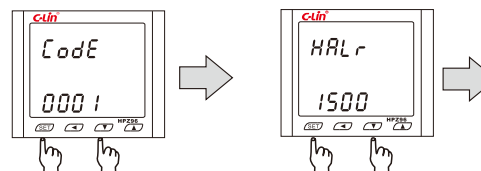
When this occurs, the lower-limit relay of the meter pulls in to trigger an alarm; the alarm stops when the currents of all three phases reach 1300A.



Operation Steps:

- a) Under the normal display interface, press the "SET" key briefly to enter the password preset state;

Notes: When pressing the "SET" key, a brief press is sufficient—there is no need to hold it down. The menu "CodE" is for password presetting.

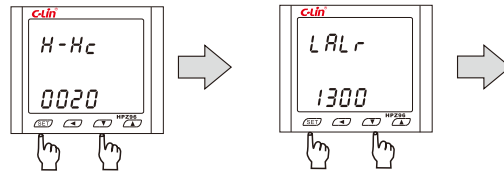


- b) Then, use the SET key in combination with the directional keys (← → ↻) to set the menu item "CodE" to "0001". Then press the "SET" key once to enter the "HALLr" setting modification interface.
- c) Then, use the SET key in combination with the directional keys (← → ↻) to set the menu item "HALLr" to "1500". Then press the "SET" key once to enter the "H-Hc" setting interface.

Notes: The password "0001" is the access code for digital output function setting.

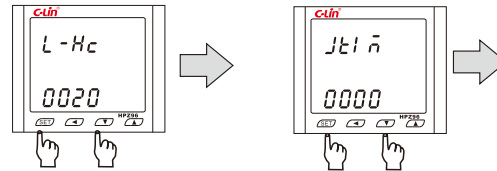
The menu item "HALLr" is for relay upper-limit alarm setting.
The menu item "H-Hc" is for upper-limit alarm hysteresis setting.

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- d) Then, use the SET key in combination with the navigation keys \leftarrow \rightarrow \uparrow \downarrow to set the menu "H-Hc" to "0020". Then press the "SET" key once to enter the setting modification interface of "LALr".
- e) Then, use the SET key in combination with the navigation keys \leftarrow \rightarrow \uparrow \downarrow to set the menu "LALr" to "1300". Then press the "SET" key once to enter the setting interface of "L-Hc".

Notes: The menu "LALr" is for the relay lower limit alarm setting.
The menu "L-Hc" is for the lower limit alarm hysteresis value setting.



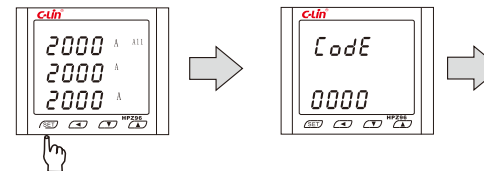
- f) Use the \leftarrow \rightarrow \uparrow \downarrow navigation keys in combination to set the menu "L-Hc" to "0020". Then press the SET key once to enter the "JtIn" setting and modification interface.
- g) Use the \leftarrow \rightarrow \uparrow \downarrow navigation keys in combination to set the menu "JtIn" to "0000". Then press and hold the SET key for 3 seconds. The meter will save the changes and return to the measurement interface.

Note: The menu "JtIn" is used to set the relay startup delay time. Under normal circumstances, the delay time is set to 0000.

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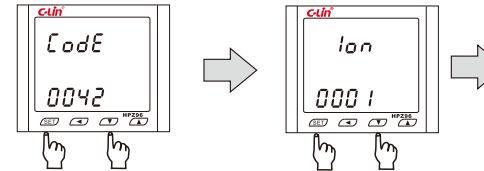
(5) Configure the Analog Output Function of HPZ96-3A-M Meter
Example: If the meter is a 2000/5A three-phase ammeter (model HPZ96-3A-M) and you need to convert phase A AC 0-1500A to DC 0-20mA for other meters, you must enable the meter's analog output function.



Operation Steps

- a) From the normal display interface, press the SET key briefly to enter the password preset state.

Notes: When pressing the SET key, a short press is sufficient—do not hold it down.
The menu "CodE" is used for password presetting.

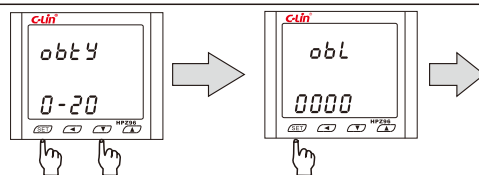


- b) Use the \leftarrow \rightarrow \uparrow \downarrow navigation keys in combination to set the menu "CodE" to 0042. Then press the SET key once to enter the "Ion" setting and modification interface.

- c) Use the \leftarrow \rightarrow \uparrow \downarrow navigation keys in combination to set the menu "Ion" to 0001. Then press the SET key once to switch the interface to the "obty" menu.

Notes: ① The menu value 0042 is the password for enabling the analog output function.
② The menu "Ion" is for phase selection of the analog output:
0001 = Phase A analog output, 0002 = Phase B analog output
0003 = Phase C analog output
③ The menu "obty" is for selecting the analog output type, which includes:
0-20mA, 0-10mA, 4-20mA

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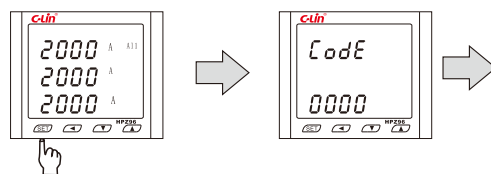


- d) Use the navigation keys in combination to set the menu "obty" to 0-20. Then press the SET key once to enter the "obl" setting and modification interface.
 e) Use the navigation keys in combination to set the menu "obl" to 0000. Then press the SET key once to switch the interface to the "obH" modification interface.

Notes: ① The menu "obH" corresponds to the display value for the high end of the analog output.
 ② The menu "obl" corresponds to the display value for the low end of the analog output.



- f) Use the navigation keys in combination to set the menu "obH" to 1500. Then press and hold the SET key. The meter will save the changes and automatically return to the measurement interface.
 (6) Configure Meter Communication Function
 Example: If the meter is a three-phase ammeter (model HPZ96-3A-C4) connected to a host computer, set the meter's communication address to 0001 and communication baud rate to 9600.

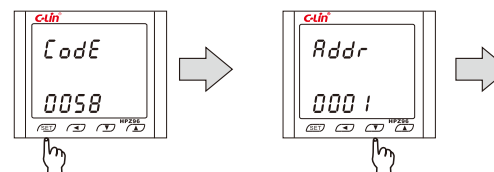


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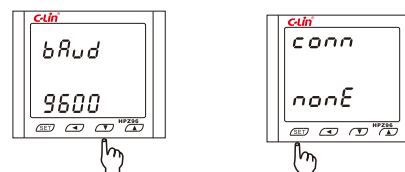
- Operation Steps
 a) From the normal display interface, press the SET key briefly to enter the password preset state.

Notes: When pressing the SET key, a short press is sufficient—do not hold it down. The menu "CodE" is used for password presetting.



- b) Use the navigation keys in combination to set the menu "CodE" to 0058. Then press the SET key once to enter the "Addr" (communication address) setting and modification interface.
 c) Use the navigation keys in combination to set the menu "Addr" to 0001. Then press the SET key once to switch the interface to the "bAud" (baud rate) modification interface.

Notes: ① The password 0058 is used to access and configure the communication function settings.
 ② The menu "Addr" is for setting the communication address.
 ③ The menu "bAud" is for setting the communication baud rate.
 ④ The menu "conn" is for setting the communication parity bit.



- d) Use the navigation keys in combination to set the menu "bAud" to 9600. Then press and hold the SET key. The meter will automatically save the modified parameters and return to the modification interface.
 e) Use the navigation keys in combination to set the menu "conn" as required:
 "nonE" = No Parity (Default)
 "EUE n" = Even Parity
 "odd" = Odd Parity

VII. Communication Protocol

1. Protocol Overview
 Protocol Type: MODBUS-RTU
 Physical Layer: Transmission Mode: RS-485 Communication Address: 1 - 247
 Communication Baud Rate: 2400, 4800, 9600 (Default), 19200
 Communication Medium: Shielded Twisted Pair

Link Layer Transmission Mode: Master-Slave Half-Duplex

Data Packet Format:

- 1 start bit, 8 data bits, even parity bit, 1 stop bit
- 1 start bit, 8 data bits, odd parity bit, 1 stop bit
- 1 start bit, 8 data bits, no parity bit, 1 stop bit (Default)

Data Frame Format:

| Address Code | Function Code | Data Code | Check Code |
|--------------|---------------|-----------|------------|
| 8-Bits | 8-Bits | N*8-Bits | 16-Bits |

Notes:

(1) The transmission sequence of data packets is always fixed: Address Code Function Code Data Code corresponding Check Code. Each data packet must be transmitted as a continuous bit stream. The meter's response time to a query is 0.1-0.5 seconds, with a typical value of 0.2 seconds.

(2) When a data frame reaches the terminal device, the addressed device will strip the frame header, read the data, and perform a check. If the verification is error-free, it will execute the task requested by the data, then return the data to the sender. The returned data includes: Address of the addressed device The executed command The requested data generated by command execution A 2-byte Check Code

(3) Address Code: The address field is located at the start of the frame, consisting of 1 byte, which identifies the unique terminal device address specified by the user. Only the addressed terminal device will exchange data with the host.

(4) Function Code: The Function Code instructs the addressed terminal device to perform a specific function. The following table lists all Function Codes supported by this meter, along with their meanings and default behaviors.

| Code | Description | Function |
|------|---------------------------|--|
| 03H | Read Data | Retrieve the current data from one or more registers |
| 08H | Energy Reset | Clear the energy data of the operated meter (for energy-measuring meters only) |
| 10H | Preset Multiple Registers | Write multiple sets of binary data into multiple registers |

(5) Data Code: The data code contains the information required for the terminal to execute a specific function, such as numerical values, reference addresses, or threshold values collected by the terminal when responding to a query. For example: If the function code instructs the terminal to read registers, the data code will specify the starting register and the number of registers to read. The data code contains the information required for the terminal to execute a specific function, such as numerical values, reference addresses, or threshold values collected by the terminal when responding to a query. For example: If the function code instructs the terminal to read registers, the data code will specify the starting register and the number of registers to read.

(6) Check Code: The check code provides a basis for the host and terminal to detect errors during data transmission. This error checking mechanism ensures that the host or terminal will not respond to erroneous data transmitted in the process, thereby improving the security and reliability of system data.

(7) Cyclic Redundancy Check (CRC) Calculation Method

The CRC occupies 2 bytes. Its value is calculated by the transmitting device, appended to the end of the data code, and sent out together. After receiving the data, the receiving device recalculates the check code for all data excluding the CRC code, then compares it with the received CRC check code. If the two values do not match, a data transmission error has occurred.

Procedure for Generating a CRC Check Code

Initialize: Set a 16-bit register to 0xFFFF; this is referred to as the CRC register.

XOR with first byte: Perform an XOR operation between the first byte of the data packet and the low byte of the CRC register, then store the result back into the CRC register.

Right shift and check: Shift the CRC register right by 1 bit, filling the highest bit with 0, then check the value of the shifted-out lowest bit.

Conditional XOR: If the lowest bit is 0: Repeat step 3 (next right shift). If the lowest bit is 1: Perform an XOR operation between the CRC register and 0xA001.

Repeat shifts: Repeat steps 3 and 4 until 8 shifts have been completed for the current byte.

Process next byte: Repeat steps 2-5 for the next data byte until all data bytes have been processed.

Swap bytes: Swap the high and low bytes of the CRC register (low byte first, high byte second).

Result: The final value of the CRC register is the CRC value.

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2. Detailed Application Layer Function Description

The protocol described in this section uses the following format (numbers are in hexadecimal).

(1) Read Data (Function Code 03)

This function allows the user to retrieve the meter's operating parameters and configuration parameters on the host (a single continuous read/write operation cannot access more than 16 registers). An example is provided below.

This example shows reading data from Meter No. 01:

Register address 0000H: Data = 0001H
 Register address 0001H: Data = 0000H
 Register address 0002H: Data = 0001H
 Register address 0003H: Data = 0001H

Message Format Sent by the Host

| Host Transmission | Number of Bytes | Transmitted Information | Information Description |
|---------------------|-----------------|-------------------------|---|
| Slave Address | 1 | 01H | Send information to the slave at address 01 |
| Function Code | 1 | 03H | Read registers |
| Starting Address | 2 | 0000H | Starting address of parameters is 0000H |
| Number of Variables | 2 | 0004H | Read 4 registers (8 bytes in total) |
| CRC Code | 2 | 4409H | Calculated by the host |

Message Format of Slave Response

| Slave Response | Byte Count | Returned Information | Information Description |
|----------------------|------------|----------------------|--|
| Slave Address | 1 | 01H | From the slave device with address 01H |
| Function Code | 1 | 03H | Read holding registers |
| Number of Bytes Read | 1 | 08H | Read 4 holding registers (total 8 bytes) |
| Holding Register 00 | 2 | 0001H | Content of holding register at address 0000H |
| Holding Register 01 | 2 | 0000H | Content of holding register at address 0001H |
| Holding Register 02 | 2 | 0001H | Content of holding register at address 0002H |
| Holding Register 03 | 2 | 0001H | Content of holding register at address 0003H |
| CRC Code | 2 | 1517H | Calculated by the meter |

(2) Energy Register Reset (Function Code 08H)

This function allows the user to reset the energy data of the meter via the master device.

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This example demonstrates the host clearing the energy data of the meter at slave address 01.

| Host Transmission | Number of Bytes | Transmitted Information | Information Description |
|-------------------|-----------------|-------------------------|--|
| Slave Address | 1 | 01H | Send command to the slave device at address 01 |
| Function Code | 1 | 08H | Clear the energy register |
| Register Address | 2 | 00FFH | Address of the energy register |
| Register Value | 2 | FF00H | Value to trigger energy register clear |
| CRC Code | 2 | 299CH | Calculated by the host |

Response from Slave: The response message format and content are identical to the message sent by the host. The response message format and content are identical to the message sent by the host.

(3) Write Multiple Registers (Function Code 10H)

This function allows the host to set parameters in multiple consecutive registers of the meter (maximum 16 registers per consecutive read/write operation).

Example: Host sets parameters for registers 0000H-0003H in the meter at address 01.

The parameters to be configured are:

Register address 0000H: Data = 0002H
 Register address 0001H: Data = 0001H
 Register address 0002H: Data = 012CH
 Register address 0003H: Data = 00C8H

Message Format Sent by the Host:

| Host Transmission | Number of Bytes | Transmitted Information | Information Description |
|---------------------|-----------------|-------------------------|--|
| Slave Address | 1 | 01H | Send message to the slave device at address 01 |
| Function Code | 1 | 10H | Write Multiple Registers |
| Starting Address | 2 | 0000H | Start from register address 0000H |
| Number of Variables | 2 | 0004H | 4 registers to be configured |
| Data Byte Length | 1 | 08H | Total 8 bytes of data to be written |
| Data to Write 1 | 2 | 0002H | For register address 0000H |
| Data to Write 2 | 2 | 0001H | For register address 0001H |
| Data to Write 3 | 2 | 012CH | For register address 0002H |
| Data to Write 4 | 2 | 00C8H | For register address 0003H |
| CRC Code | 2 | 69D9H | Calculated by the host |

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Message Format for Slave Response Return

| Slave Response | Byte Count | Returned Information | Information Description |
|---------------------|------------|----------------------|-----------------------------------|
| Slave Address | 1 | 01H | From the host at address 01 |
| Function Code | 1 | 10H | Write multiple registers |
| Starting Address | 2 | 0000H | Start from register address 0000H |
| Number of Variables | 2 | 04H | 4 registers |
| CRC Code | 1 | 1CC3H | Calculated by the instrument |

This function also actually allows the user to configure a single register of the instrument on the host. At this point, you only need to set the number of variables to 1, set the data byte length to 2 bytes, and point the start address to the address of the register to be modified.

Attachment: Parameter address allocation: (W: Write; R: Read)

| Address | Code | Variable Name | Unit | Value Range | Read/Write | Remarks |
|---------|----------|---|-------------|-------------|------------|---------|
| 0000H | Reserved | | | | | |
| 0001H | Reserved | | | | | |
| 0002H | HALr | Upper Power Alarm Value | | 0-9999 | W/R | |
| 0003H | H-HC | Upper Alarm Hysteresis Value | | 0-9999 | W/R | |
| 0004H | LALr | Lower Power Alarm Value | | 0-9999 | W/R | |
| 0005H | L-HC | Lower Alarm Hysteresis Value | | 0-9999 | W/R | |
| 0006H | JTIM | Relay Alarm Delay Time | 0.1 seconds | 0-600 | W/R | |
| 0007H | DISA | Primary Side Current Full Scale Value | Ampere | 0-9999 | W/R | |
| 0008H | DISV | Primary Side Voltage Full Scale Value | Volt | 0-9999 | W/R | |
| 0009H | TIME | Current & Voltage Display Cycle Interval | 0.1 seconds | 0-600 | W/R | |
| 000AH | Ion | Transmitter Object Selection | | 1-3 | W/R | Note 1 |
| 000BH | obty | Transmitter Type Selection | | 0-2 | W/R | Note 2 |
| 000CH | ObL | Transmitter Low-End Corresponding Display Value | | 0-9999 | W/R | |

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| Address | Code | Transmitter High-End Corresponding Display Value | Instrument Communication Address | Instrument Communication Baud Rate | Communication Check Bit | Phase A Current | Phase B Current | Phase C Current | Phase A Voltage (AB Line Voltage) | Phase B Voltage (BC Line Voltage) | Phase C Voltage (CA Line Voltage) |
|---------|----------|--|----------------------------------|------------------------------------|-------------------------|-----------------|-----------------|-----------------|-----------------------------------|-----------------------------------|-----------------------------------|
| 000DH | ObH | | | | | 0-9999 | W/R | | | | |
| 000EH | Addr | | | 1-247 | W/R | | | | | | |
| 000FH | Baud | | | 0-2 | W/R | Note 3 | | | | | |
| 0010H | conn | | | 0-2 | R | Note 6 | | | | | |
| 0011H | Reserved | | | | | | | | | | |
| 0012H | Reserved | | | | | | | | | | |
| 0014H | I1 | Phase A Current | Ampere | 0-9999 | R | Note 4 | | | | | |
| 0015H | I2 | Phase B Current | Ampere | 0-9999 | R | | | | | | |
| 0016H | I3 | Phase C Current | Ampere | 0-9999 | R | | | | | | |
| 0017H | U1 | Phase A Voltage (AB Line Voltage) | Ampere | 0-9999 | R | Note 5 | | | | | |
| 0018H | U2 | Phase B Voltage (BC Line Voltage) | Ampere | 0-9999 | R | | | | | | |
| 0019H | U3 | Phase C Voltage (CA Line Voltage) | Ampere | 0-9999 | R | | | | | | |
| 001AH | Reserved | | | | | | | | | | |
| 001BH | Reserved | | | | | | | | | | |
| 001CH | Reserved | | | | | | | | | | |
| 001DH | Reserved | | | | | | | | | | |
| 001EH | Reserved | | | | | | | | | | |
| 001FH | Reserved | | | | | | | | | | |

Communication Notes for Three-Phase Current and Voltage Meter:

Note 1: Data in the Transmitter Object Selection Register (Ion) 1 = Ia or Ua 2 = Ib or Ub 3 = Ic or Uc

Note 2: Data in the Transmitter Type Selection Register (obty) 0 = 0-20mA output 1 = 4-20mA output 2 = 0-10mA output

Note 3: Data in the Instrument Baud Rate Register (Baud) 0 = 2400 1 = 4800 2 = 9600

Note 4: The value in a certain phase current register of the meter is In, and in the primary side full-scale current value register (DISA) of the meter

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Let the value be I_m . Based on the meter's factory-set input current signal (1A or 5A), the Current Transformer (CT) ratio can be calculated as $CT = I_m/1$ or $CT = I_m/5$.

The secondary current value measured by the meter is $I_n \times 0.001$.

The primary current value measured by the meter is $I_n \times 0.001 \times CT$.

Note 5: Let U_n be the value in a phase voltage register of the meter, and V_m be the value in the primary side full-scale voltage register (DISV) of the meter. Based on the meter's factory-set input voltage signal (100V or 500V), the Potential Transformer (PT) ratio can be calculated as $PT = V_m/100$ or $PT = V_m/500$.

The secondary voltage value measured by the meter is $U_n \times 0.1$.

The primary voltage value measured by the meter is $U_n \times 0.1 \times PT$.

Note 6: Communication check bit

0: No check1: Odd parity2: Even parity

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VIII. Meter Installation and Precautions

1. Meter Installation Method:

Based on the meter's external dimensions and mounting hole size, drill a hole on the mounting panel. Embed the meter into the mounting hole, then insert the two mounting accessories into the mounting guide slots on both sides of the meter housing respectively, push them tightly by hand, and then tighten the screws.

2. Meter Usage Precautions:

(1) To ensure normal operation and accurate measurement of the meter, it must be preheated for 15 minutes first.

(2) The meter's range has been set at the factory to match the specification parameters provided by the user when placing the order. Before use, recheck whether the meter's range setting matches the specifications of the transformers or shunts used by the user. If there is a mismatch, the meter's range program needs to be reconfigured.

(3) The meter must be powered by the rated voltage when supplying power to it, so the power supply can only be turned on after the wiring work is completed.

(4) To ensure the meter can measure and control accurately, it is prohibited to operate it in environments with flammable and explosive gases, heavy dust, or corrosive gases.

IX. Ordering Instructions

When placing an order, please specify the required model, working power supply, input signal, transformation ratio, output requirements, communication functions, etc.

Examples: Model: HPZ96-3V; Working power supply: AC220V; Input signal: AC380V (or ***100V transformation ratio)

Model: HPZ96-3A; Working power supply: AC220V; Input signal: AC5A (or **5A transformation ratio)

Model: HPZ96-3AV; Working power supply: AC220V; Input signal: Current AC5A + Voltage AC380V (or ***5A transformation ratio)