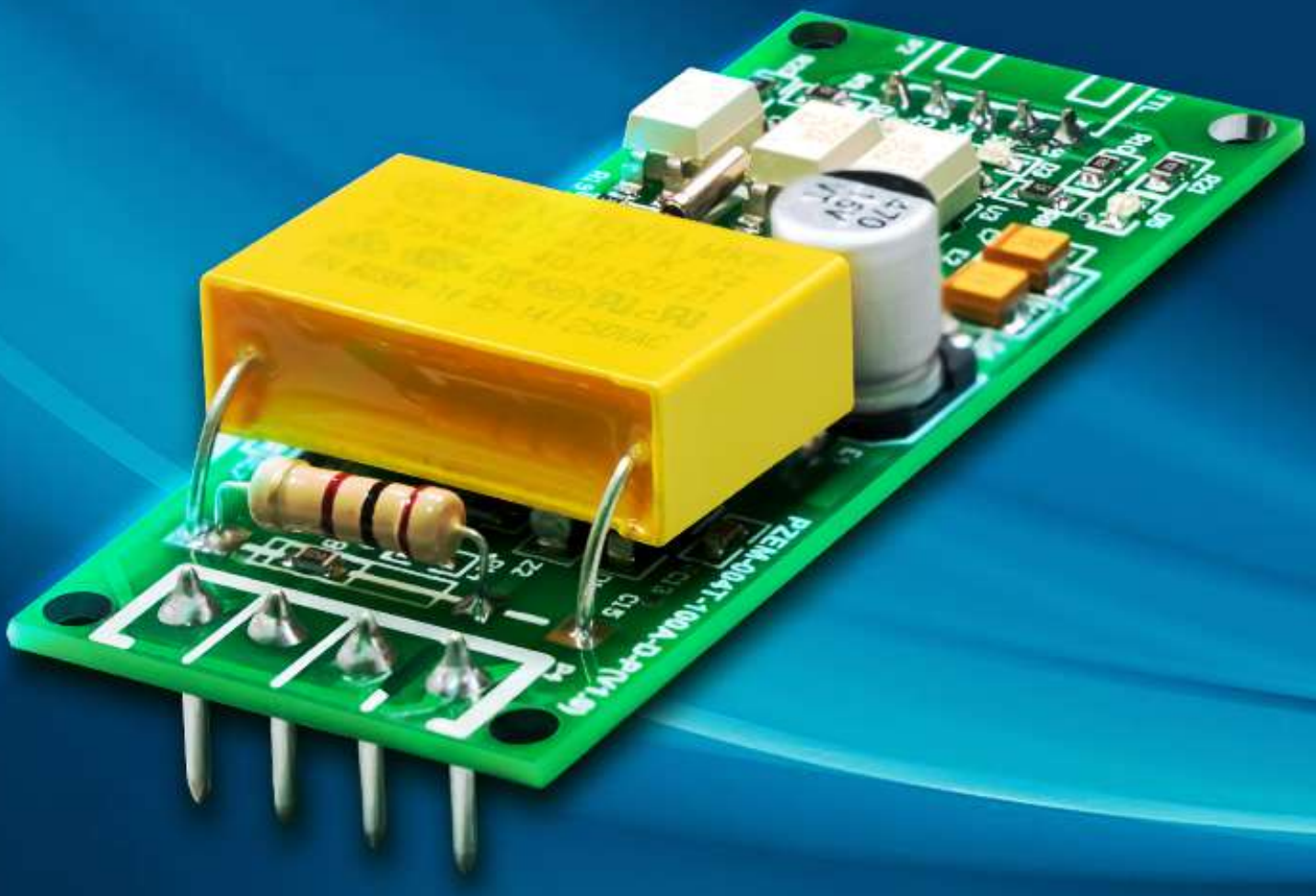
AC COMMUNICATION MODULE

PZEM-004T-100A-D-P All WIN systems are available

Energy	Frequency	Power	TTL Interface
Voltage	Current	power factor	MODBUS-RTU

HIGH PRECISION FAST RESPONSE

New upgrade 80%, higher communication stability

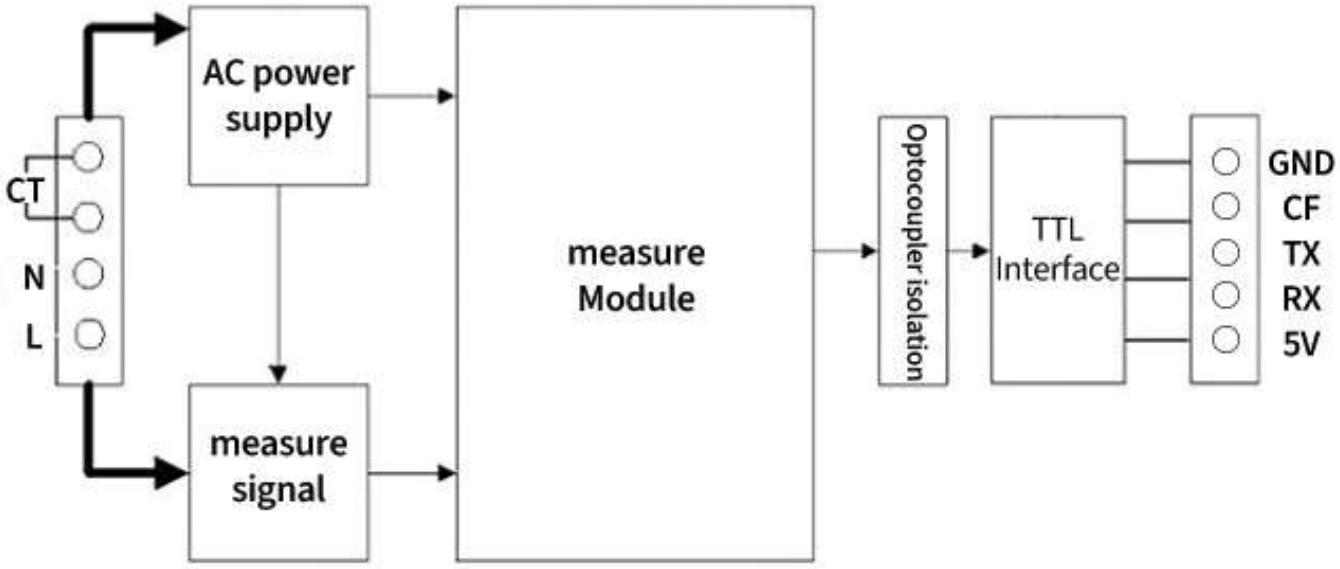


NEW UPGRADE SHOCK RELEASE

PZEM-004T-100A-D-P Equipped with PC software

100A range (external transformer)

Voltage: AC80~260V Current: 0~100A



A VARIETY OF PACKAGE COMBINATIONS

Give you more options

100A range (external transformer)

004T-100A-D-P

LOADING.....

100A range (external transformer)

004T-100A-D-P

+

Open CT

LOADING.....

100A range (external transformer)

004T-100A-D-P

+

Close CT

LOADING.....

Close CT

Open CT

Common point: Both are 100A transformers, can be universal.
Difference: The shape is shown in the figure, open and close type can be opened and then closed, the test current directly on the card, a little convenient.

100A range (external transformer)

004T-100A-D-P

+

Close CT

LOADING.....

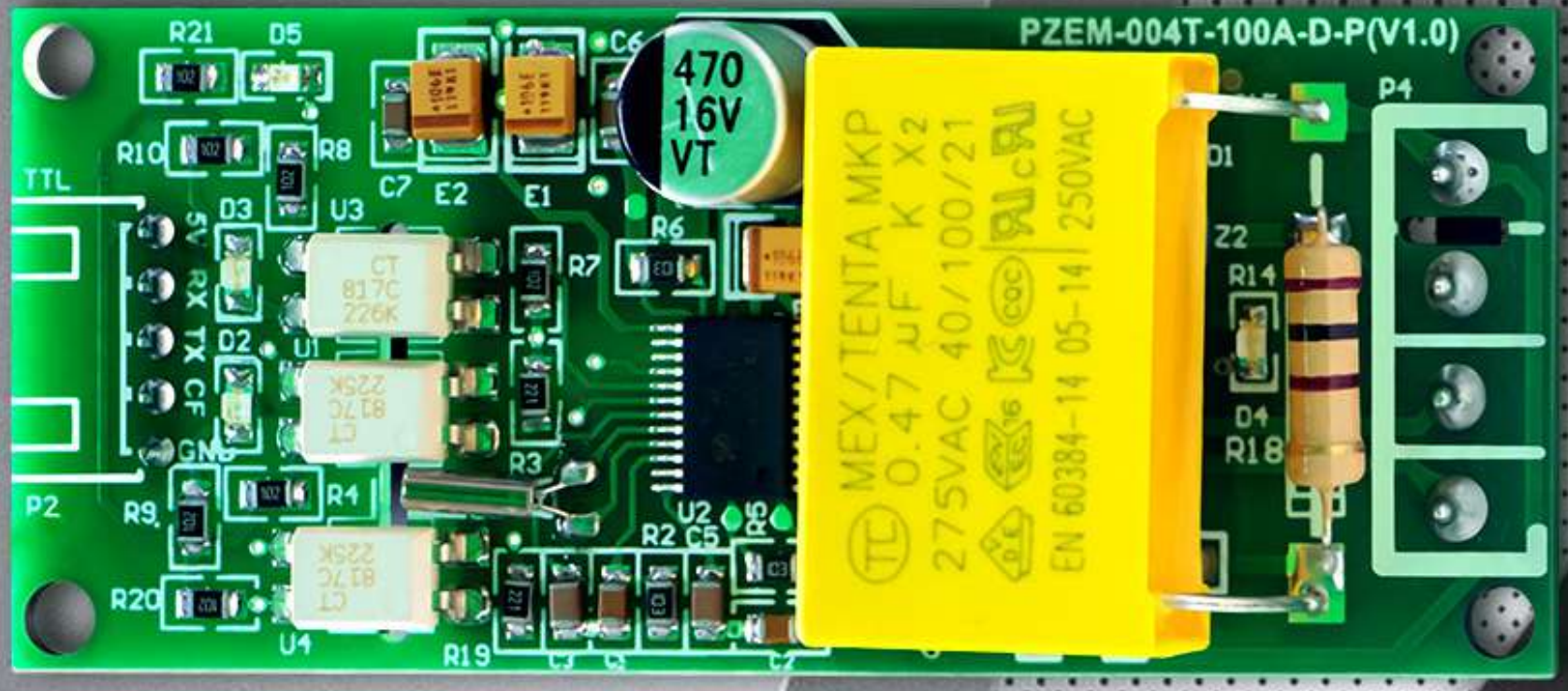
Close CT

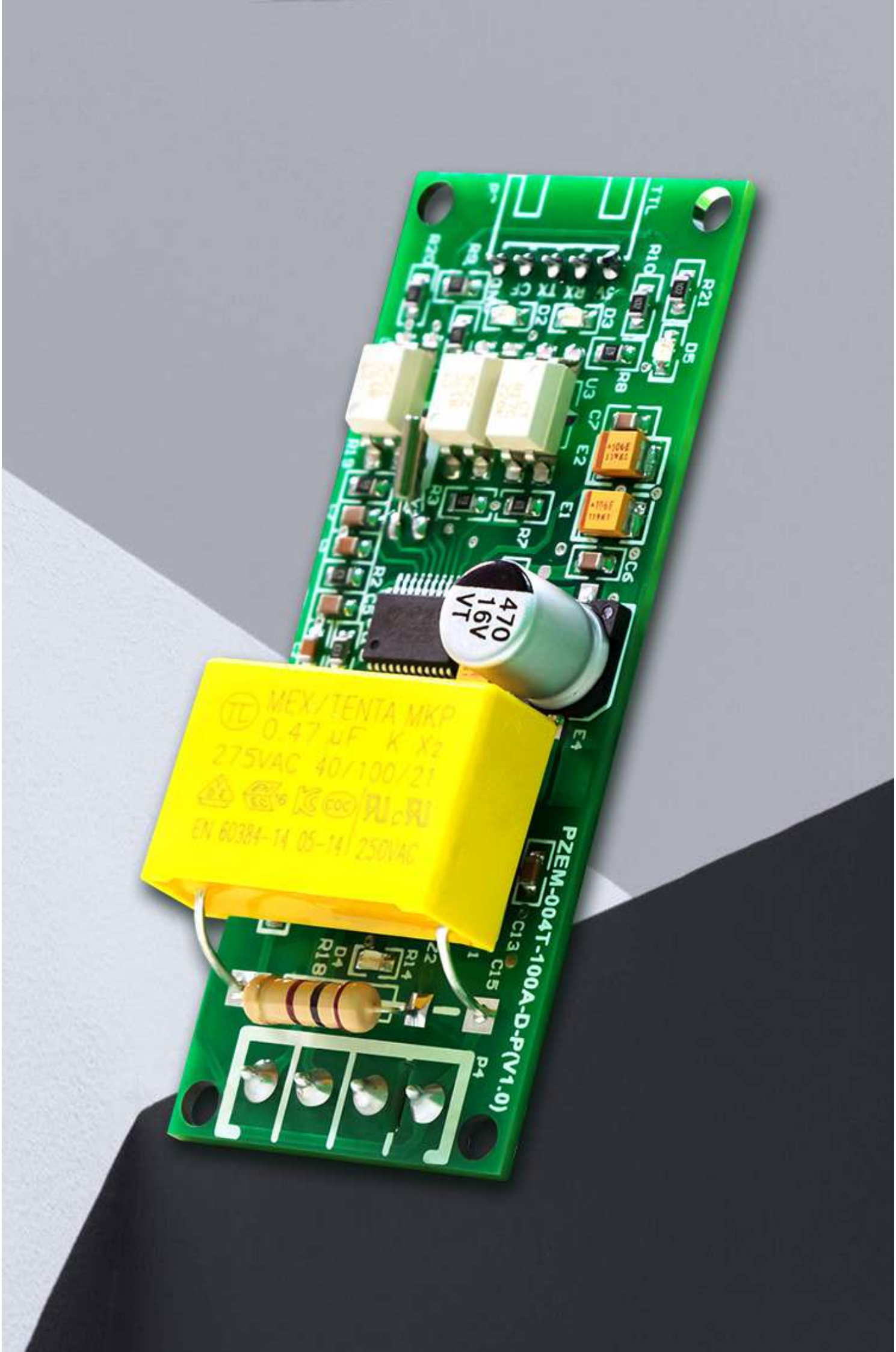
Open CT

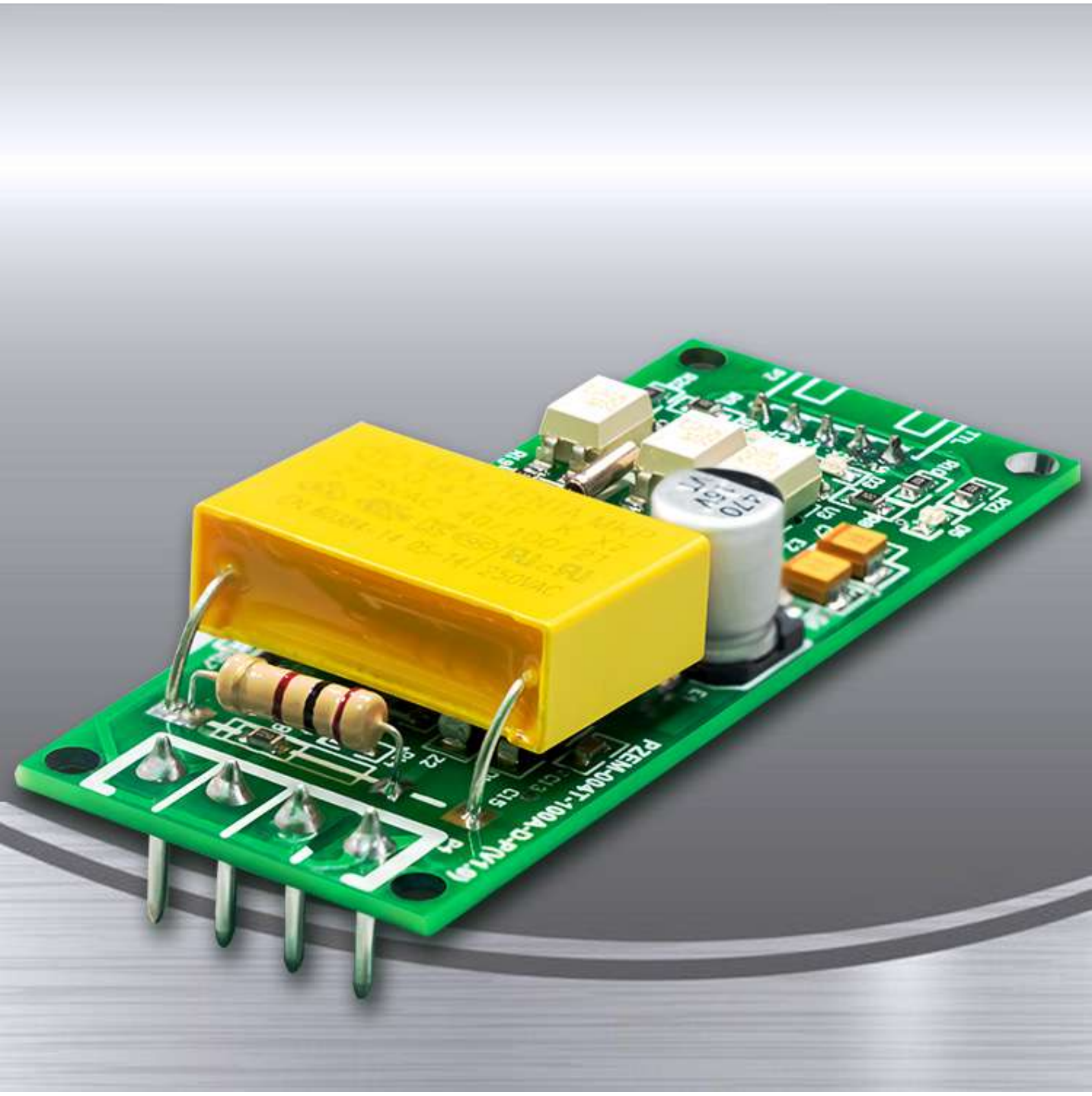
Common point: Both are 100A transformers, can be universal.
Difference: The shape is shown in the figure, open and close type can be opened and then closed, the test current directly on the card, a little convenient.

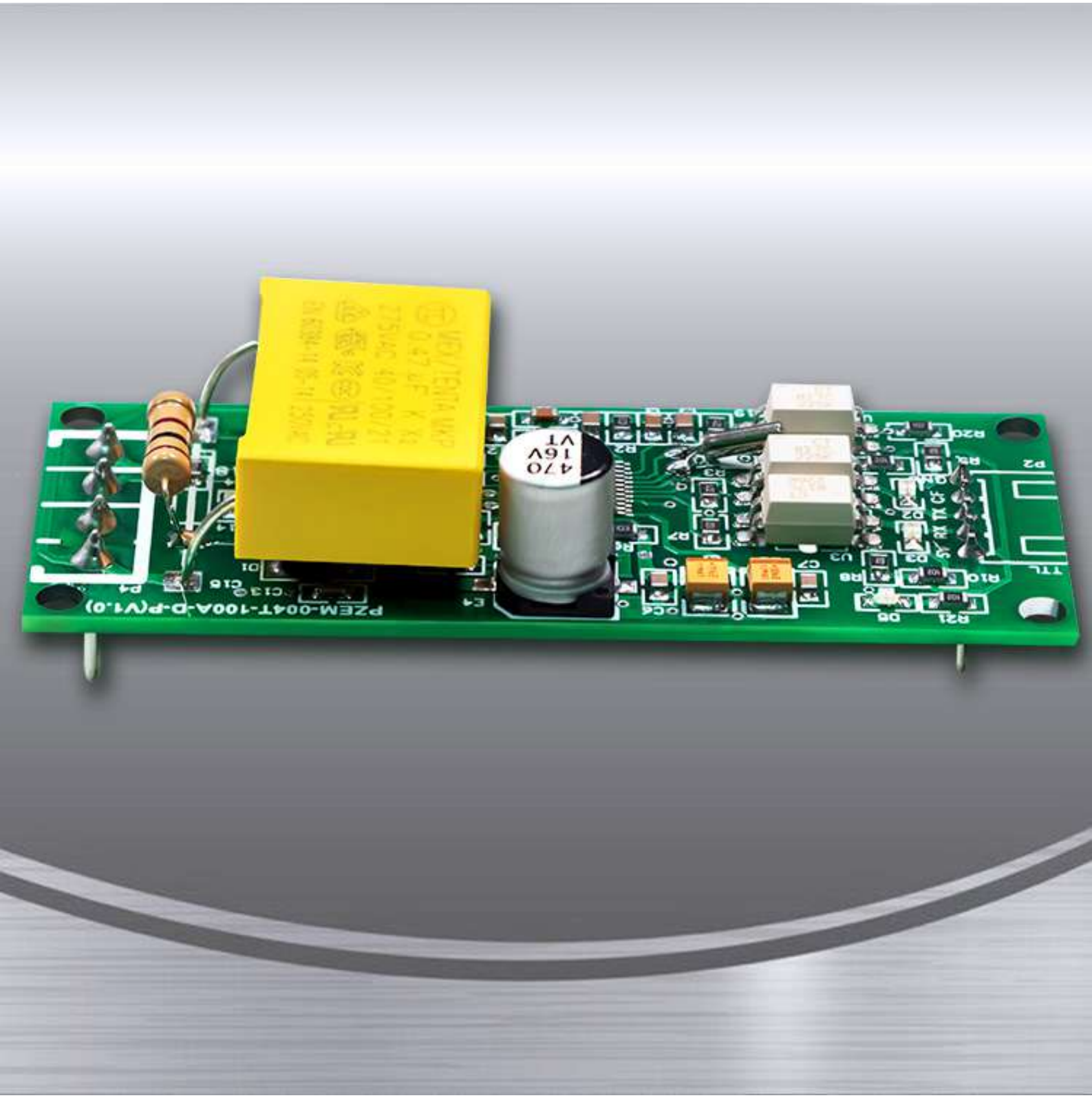
Product Photography

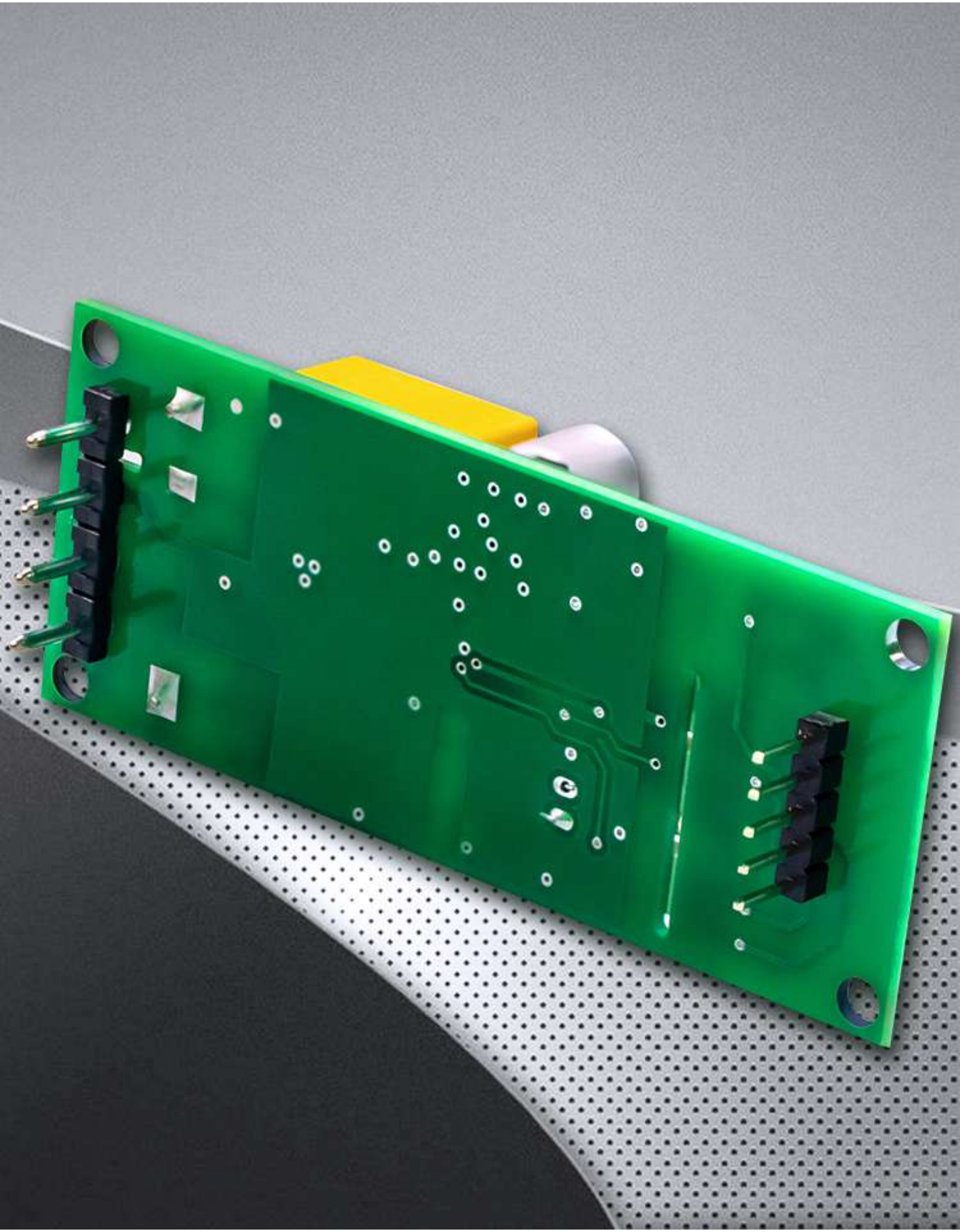
360° all-round display

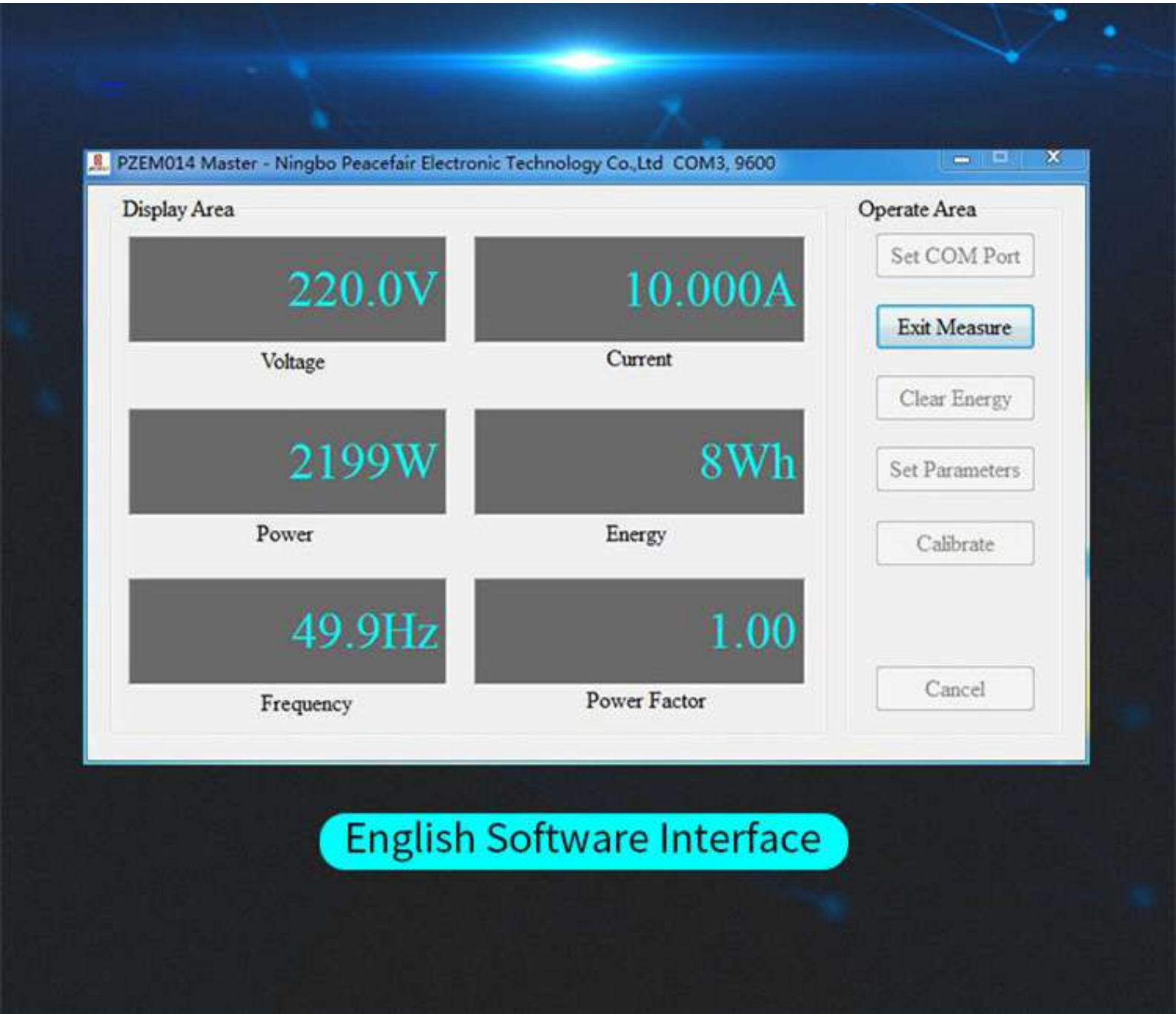

PZEM-004T-100A-D-P(V1.0)
470
16V
VT
MEX/TENTA MKP
0.47 µF K X2
275VAC 40/100/21
EN 60384-14 05-14 250VAC
TTL
5V
RX
TX
CF
GND
P2
P4
R21
D5
R10
R8
C7
E2
E1
C6
D3
U3
R6
R7
D2
U1
R3
R4
R9
U2
R2
C5
R20
U4
R19
D1
Z2
R14
D4
R18


PZEM-004T-100A-D-P(V1.0)
470
16V
MEX/TENTA MKP
0.47 uF K X2
275VAC 40/100/21
EN 60384-14 05-14 250VAC




470
16V
PZEM-004T-100A-D-P(V1.0)



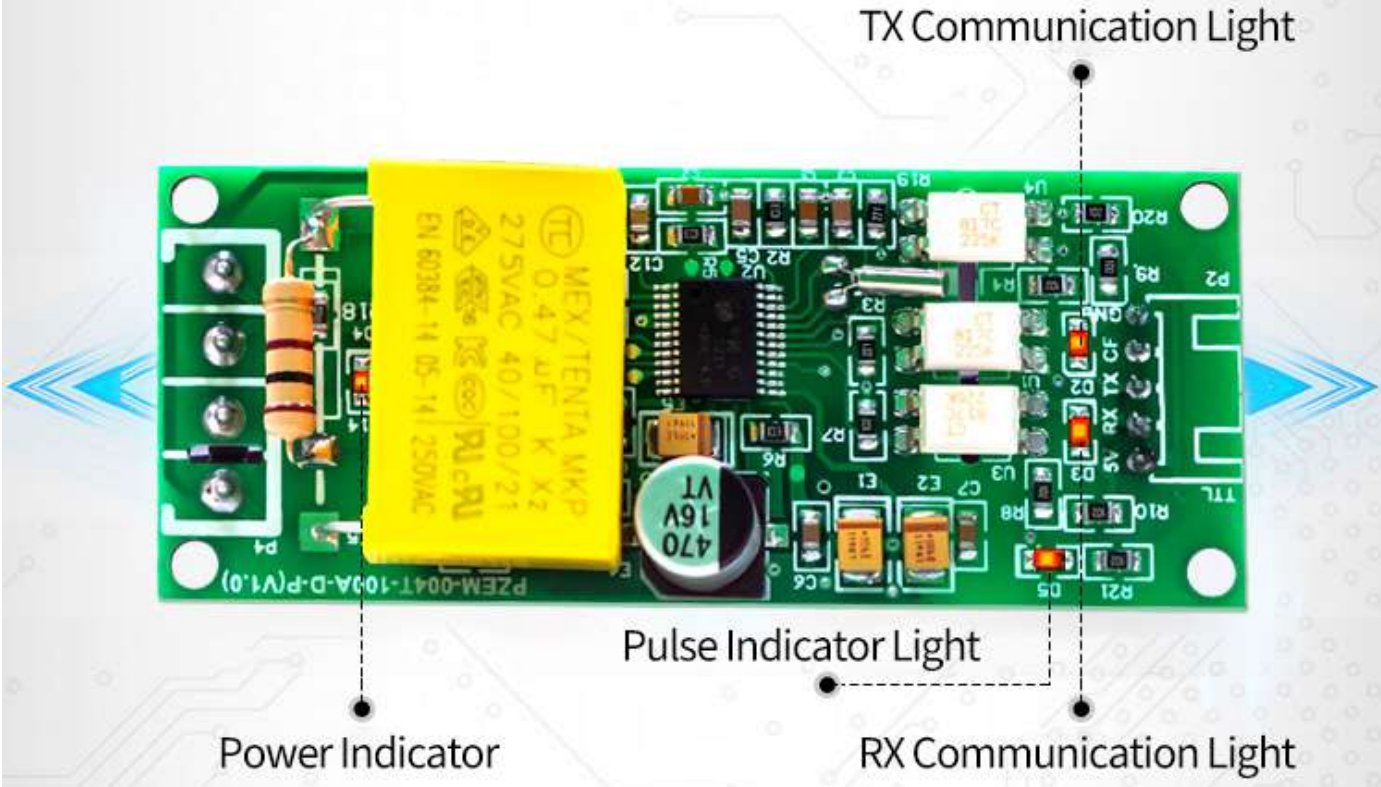


English Software Interface

Product Parameters

Product size

Indicator light display



FUNCTION DESCRIPTION

Function	Measuring range	Starting measure current/power	Resolution	Measure-ment accuracy	Display format
	100A	100A			
Voltage	80~260V		0.1V	0.5%	
Current	0~100A	0.02A	0.001A	0.5%	
Active power	0~23kW	0.4W	0.1W	0.5%	<1000W, it display one decimal, such as: 999.9W; ⩾1000W, it display only integer, such as: 1000W
Power factor	0.00~1.00		0.01	1%	
Frequency	45Hz~65Hz		0.1Hz	0.5%	
Active energy (Reset energy: use software to reset)	0~9999.99kWh		1Wh	0.5%	<110kWh, the display unit is Wh(1kWh=1000Wh), such as: 9999Wh; ⩾10kWh, the display unit is kWh, such as: 9999.99kWh
Over power alarm	Active power threshold can be set, when the measured active power exceeds the threshold, it can alarm				
Pulse Output	1600imp/kwh				
Communication interface	RS485 interface				
size	Length * width * height=73.7*30*20mm				
Power Supply	The power supply of single-phase power-frequency network supplies power to the main circuit through resistance-capacitance step-down, TTL output communication interface and Main circuit optocoupler isolation, for passive output, communication needs to provide external 5V power supply				
working temperature	-20°C~+60°C				

SPECIAL NOTE

The TTL interface of this module is a passive interface, which requires external 5V power supply. That is to say, all four ports must be connected (5V, RX, TX, GND) when communicating, otherwise they cannot communicate.
working temperature：-20°C ~ +60°C。


COMMUNICATION PROTOCOL DISPLAY

1.Physical layer protocol

Physical layer use UART to RS485 communication interface

Baud rate is 9600, 8 data bits, 1 stop bit, no parity

2.Application layer protocol

The application layer use the Modbus-RTU protocol to communicate. At present, it only supports function codes such as 0x03 (Read Holding Register), 0x04 (Read Input Register), 0x06 (Write Single Register), 0x41 (Calibration), 0x42 (Reset energy).etc.

0x41 function code is only for internal use (address can be only 0xF8), used for factory calibration and return to factory maintenance occasions, after the function code to increase 16-bit password, the default password is 0x3721

The address range of the slave is 0x01 ~ 0xF7. The address 0x00 is used as the broadcast address, the slave does not need to reply the master. The address 0xF8 is used as the general address, this address can be only used in single-slave environment and can be used for calibration etc.operation.

3. Read the measurement result

The command format of the master reads the measurement result is(total of 8 bytes):

Slave Address + 0x04 + Register Address High Byte + Register Address Low Byte + Number of Registers High Byte + Number of Registers Low Byte + CRC Check High Byte + CRC Check Low Byte.

The command format of the reply from the slave is divided into two kinds:

Correct Reply: Slave Address + 0x04 + Number of Bytes + Register 1 Data High Byte + Register 1 Data Low Byte + ... + CRC Check High Byte + CRC Check Low Byte

Error Reply: Slave address + 0x84 + Abnormal code + CRC check high byte + CRC check low byte

Abnormal code analyzed as following (the same below):

0x01,Illegal function; 0x02,Illegal address;
0x03,Illegal data; 0x04,Slave error。

The register of the measurement results is arranged as the following table:

Register address	Description	Resolution
0x0000	Voltage value	1LSB correspond to 0.1V
0x0001	Current value low 16 bits	1LSB correspond to 0.001A
0x0002	Current value high 16 bits	
0x0003	Power value low 16 bits	1LSB correspond to 0.1W
0x0004	Power value high 16 bits	
0x0005	Energy value low 16 bits	1LSB correspond to 1Wh
0x0006	Energy value high 16 bits	
0x0007	Frequency value	1LSB correspond to 0.1Hz
0x0008	Power factor value	1LSB correspond to 0.01
0x0009	Alarm status	0xFFFF is alarm, 0x0000is not alarm

For example, the master sends the following command (CRC check code is replaced by 0xHH and 0xLL, the same below):

0x01 + 0x04 + 0x00 + 0x00 + 0x00 + 0x0A + 0xHH + 0xLL

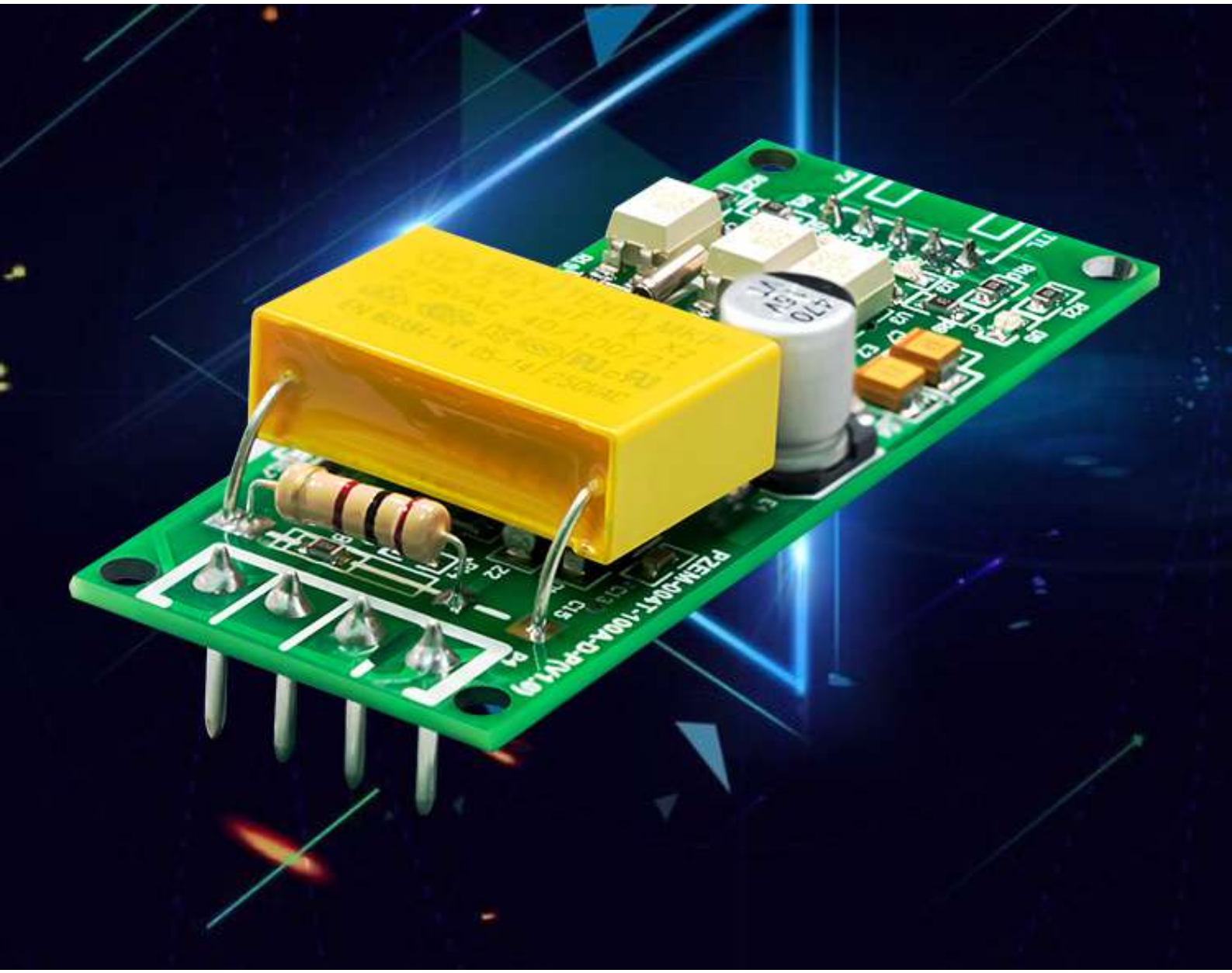
Indicates that the master needs to read 10 registers with slave address 0x01 and the start address of the register is 0x0000

The correct reply from the slave is as following:

0x01 + 0x04 + 0x14 + 0x08 + 0x98 + 0x03 + 0xE8+0x00 + 0x00 +0x08 + 0x98+ 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x00 + 0x01 + 0xF4 + 0x00 + 0x64 + 0x00 + 0x00 + 0xHH + 0xLL

The above data show:

- Voltage is 0x0898, converted to decimal is 2200, display 220.0V
- Current is 0x000003E8, converted to decimal is 1000, display 1.000A
- Power is 0x00000898, converted to decimal is 2200, display 220.0W
- Energy is 0x00000000, converted to decimal is 0, display 0Wh
- Frequency is 0x01F4, converted to decimal is 500, display 50.0Hz
- Power factor is 0x0064, converted to decimal is 100, display 1.00
- Alarm status is 0x0000, indicates that the current power is lower than the alarm power threshold



4.Read and modify the slave parameters

At present,it only supports reading and modifying slave address and power alarm threshold

The register is arranged as the following table:

Register address	Description	Resolution
0x0001	Power alarm threshold	1LSB correspond to 1W
0x0002	Modbus-RTU address	The range is 0x0001~0x00F7

The command format of the master to read the slave parameters and read the measurement results are same(descrybed in details in Section 2.3), only need to change the function code from 0x04 to 0x03.

The command format of the master to modify the slave parameters is (total of 8 bytes):

Slave Address + 0x06 + Register Address High Byte + Register Address Low Byte + Register Value High Byte + Register Value Low Byte + CRC Check High Byte + CRC Check Low Byte.

The command format of the reply from the slave is divided into two kinds:

Correct Response: Slave Address + 0x06 + Number of Bytes + Register Address Low Byte + Register Value High Byte + Register Value Low Byte + CRC Check High Byte + CRC Check Low Byte.

Error Reply: Slave address + 0x86 + Abnormal code + CRC check high byte + CRC check low byte.

For example, the master sets the slave's power alarm threshold:

0x01 + 0x06 + 0x00 + 0x01 + 0x08 + 0xFC + 0xHH + 0xLL

Indicates that the master needs to set the 0x0001 register (power alarm threshold) to 0x08FC (2300W).

Set up correctly, the slave return to the data which is sent from the master.

For example, the master sets the address of the slave:

0x01 + 0x06 + 0x00 + 0x02 + 0x00 + 0x05 + 0xHH + 0xLL

Indicates that the master needs to set the 0x0002 register (Modbus-RTU address) to 0x0005

Set up correctly, the slave return to the data which is sent from the master.

5. Reset energy

The command format of the master to reset the slave's energy is (total 4 bytes):

Slave address + 0x42 + CRC check high byte + CRC check low byte.

Correct reply: slave address + 0x42 + CRC check high byte + CRC check low byte.

Error Reply: Slave address + 0xC2 + Abnormal code + CRC check high byte + CRC check low byte.

6. Calibration

The command format of the master to calibrate the slave is (total 6 bytes):

0xF8 + 0x41 + 0x37 + 0x21 + CRC check high byte + CRC check low byte.

Correct reply: 0xF8 + 0x41 + 0x37 + 0x21 + CRC check high byte + CRC check low byte.

Error Reply: 0xF8 + 0xC1 + Abnormal code + CRC check high byte + CRC check low byte.

It should be noted that the calibration takes 3 to 4 seconds, after the master sends the command, if the calibration is successful, it will take 3 ~ 4 seconds to receive the response from the slave.

7. CRC check

CRC check use 16bits format, occupy two bytes, the generator polynomial is X16 + X15 + X2 +1, the polynomial value used for calculation is 0xA001.

The value of the CRC check is a frame data divide all results of checking all the bytes except the CRC check value.