SOMMY® 中大电力 中山市中大电力自动化有限公司 SOMMY Automation Group Shares co.,Ltd

ES921 Series Three Phase Intelligent Power Meter Operation Manual

This series meters are widely applied to control system, SCADA system and energy management system, transformer substation automation, distributing net automation, residence community electrical power monitor, industrial automation, intelligent construction, intelligent switchboard, switch cabinet, etc. It is easy to install and maintain, simple connection, programmable setting parameters on meters or computer.

Features:

- ⊙ Measuring Items:Voltage/Current/Active Power/Reactive power/Frequency/ Power Factor
- ⊙ Two DI and two DO , with remote communication and remote control function
- ⊙ Output input is completely isolated
- ⊙ True effective value measurement
- ⊙ With RS485 interface/Modbus RTU communication protocol
- ⊙ With two programmable alarm
- ⊙ Display programe setting parameters

⚠ Warning

1. If you do not follow the instructions, accidents will occur and the product will be destroyed.
2. We may update the manual information without prior notice.
3. Our company reserves the right to explain the above information.

National High-tech Enterprise/National Standard Drafting Unit

Sevice line: 400-8866-986 Version：KKES921-C01E-A/0-20210526

■ Model

E S 92 1 ▬ □

- Measurement parameter： V: 3 phase voltage A: 3 Phase current P: 3 phase voltage, current, power W: all the 3 phase parameters
- Display: 1: LED display
- Dimension: 92：96H×96W×61.5L (mm)
- ES Series Three Phase Intelligent Power Meter

■ Model Indication

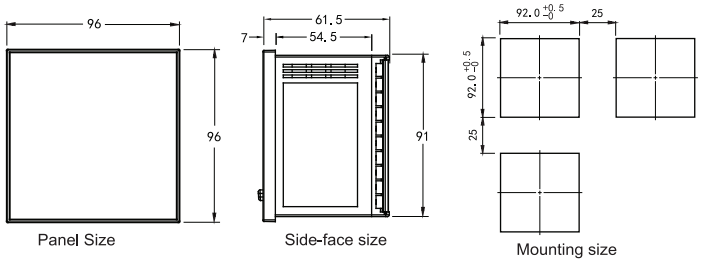
Model	Measure parameter	Communication	DI(digital input)	DO(digital output)
ES921-V	3 phase voltage	one RS485	2	2
ES921-A	3 phase current	one RS485	2	2
ES921-P	3 phase parameter(without kwh)	one RS485	2	2
ES921-W	all 3 phase parameters	one RS485	2	2

■ Main Technical Parameters

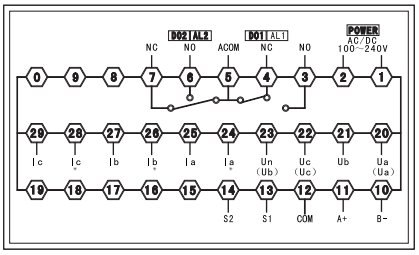
Connection	3 Phase 3 Wires, 3 Phase 4 Wires
Voltage range	AC 10-480V(L-L)
Voltage overload	Continuous:1.2times Instantaneous:2times/2S
Voltage consumption	<0.5VA (each Phase)
Voltage impedance	≥300KΩ
Voltage accuracy	RMS measurement accurancy class 0.5
Current range	AC 0.025~5A
Current Overload	Continuous:1.2times Instantaneous:10times/2S
Current Consumption	<0.4VA (each phase)
Current impedance	<20mΩ
Current accuracy	RMS measurement accurancy class 0.5
Freqency	45~60Hz accuracy 0.01Hz
Power	Active/Reactive/Apparent Power, Accuracy Class 0.5
Energy accuracy	Active power : 1.0, reactive power accuracy: 2.0 Note: Kwh metering initially adopts the 6 integer + 2 decimal mode. After the measurement reaches 999999.99, it will automatically turn over to 7 integer + 1 decimal mode. When measurement reaches 9999999.9 , restart measuring from 0. Total metered kwh can reach 10 million kWh. (Meter display decimal point jump has no effect on the energy value decimal point via RS485)

Display	LED display
Power Supply	AC/DC 100~240V (85～265V)
Power Consumption	≤5VA
Digital out interface	RS485, MODBUS-RTU Protocol
Switch input	2 switch inputs (dry contact method)
Alarm Output	2 switch output, 250V AC/3A , or 30V DC/5A
Working environment	Temperature : -10 -50℃ Humidity: < 85%RH. Non-corrosive Gas; altitude≤2500m
Storage environment	-40~70℃
Withstand voltage	Current VS 485 connection, DI connection ≥ DC 2000V
Isolation	Input/ Output/ Power supply to meter cover>5MΩ
Dimension	96H×96W×61.5L (mm)
Weight	0.5kg

■ Dimension and Mounting Size

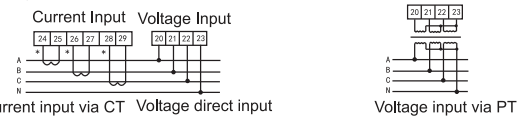


■ Connection Drawing

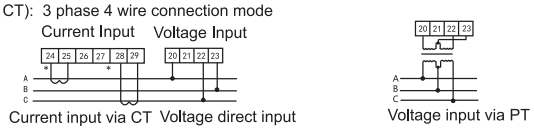


Note: Please suject to the connection drawing on the meter if have any changes.
Voltage input wire terminals with bracket indicate 3 phase 3 wire connection method.

Mode 1 (3pcs CT): 3 phase 4 wire connection mode



Mode 2(2pcs CT): 3 phase 4 wire connection mode



Explanation:

A.Voltage input: Input voltage should be not higher than the rated input voltage of meter,otherwise a PT should be used.

B.Current input:Standard rated input current is 5A. A CT should be used when the input current is bigger than 5A. If some other meters are connected with the same CT, the connection should be serial for all meters.

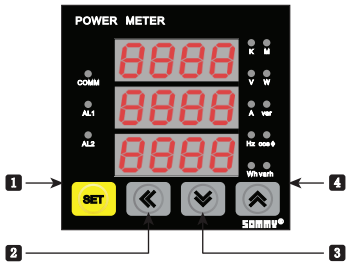
C.Please make sure that the input voltage is corresponding to the input current, they should have same phase sequence and direction, otherwise data and sign error may occur (power and energy).

D.The connection mode of meter which is connected to power network should depend on the CT quantity. For 2pcs of CT, it should be 3 phase 3 wire connection. For 3 pcs of CT, it should be 3 phase 4 wire connection meter wire connection, the input network link setting in the software menu should be according to the connection mode of the measured load.Otherwise, measured voltage and power will be wrong.

Caution:

1.Power supply connection must be correct.
2.Pay attention on the phase sequence of voltage signal input.
3.Current signal input should be connected with same name terminal as per the connection drawing.
4.Connection mode should be consistent with the "LIN" menu setting.(3 phase 3 wire 3 phase 4 wire)
5. Isolation between power supply and main measurement circuit, in cause of leakage switch wrong action.

■ Panel Indicate



Symbol	Function
K	K Unit indication light
M	M unit indication light
V	Voltage display
W	Active power display
A	Current display
Var	Reactive power display
Hz	Frequency display
cosø	Power factor display
COMM	communication light
AL1	Alarm 1 indication light
AL2	Alarm 2 indication light
Wh	Kwh indication
Varh	Kvarh indication

Item	Symbol	Name	Function
1	SET	Set Key	Press this key for 3 seconds to enter menu ; to confirm the modified menu value
2	«	Left Key	Act as return key in menu operation; used as shift key in menu modification status
3	»	Decrease Key	Enter data modification in menu operation; Decrease the value
4	^	Increase Key	Enter data modification in menu operation; Increase the value

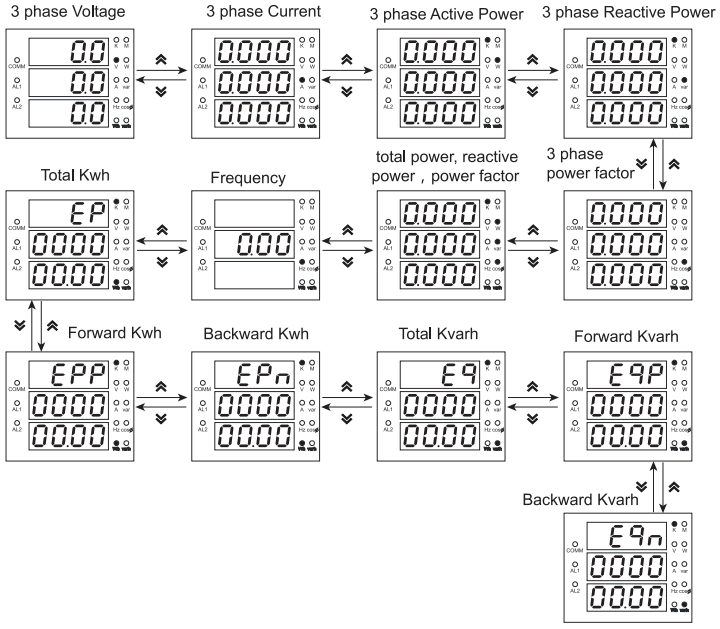
Measure and display Indication:

1. In 3 phase 4 wire measure status , press " ^ /» " key to shift display of 3 phase voltage, 3 phase current, 3 phase active power, 3 phase reactive power, 3 phase apparent power, 3 phase power factor, total power, frequency, Kwh, Kvarh ect.
2. DO1 , DO2 used as alarm output status indication in alarm mode ; used as switch output status indication in remote control mode.
3. COM flashing means in communication status.
4. EPP(Kwh) indicates total Kwh (forward kwh and backward kwh algebraic sum), EQ(Kvarh) indicates total kvarh (forward kvarh and backward kvarh algebraic sum)

Note：26 English letters display mode：

English letters	A	B	C	D	E	F	G	H	I	J	K	L	M
Display mode	A	b	C	d	E	F	G	H	I	J	K	L	M
English letters	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Display mode	n	o	P	q	r	S	t	U	U	U	U	y	Z

Illustration for measure interface shift display:



■ Menu modification instructions

Measurement Status

1. In 3 phase 4 wire status, press ^ or » key, it can shift display 3 phase voltage, 3 phase current, 3 phase active power, 3 phase reactive power, 3 phase power factor , total active power , total reactive power and total power factor, frequency.
2. In 3 phase 4 wire status, press SET key to shift display of phase voltage and line voltage. But in 3 phase 3 wire status, only display line voltage.
3. Press SET key more than 5 seconds to enter the user menu. please refer to the menu structure for the operation process.

Under user menu status

1.If current menu is first or second level menu display, press SET key to enter next level menu display. Press » or ^ for short time to modify the menu or submenu .

2.If the current menu is second or third level display, press « key for short time to return to previous menu.

3.If the current menu is third level display, press » or ^ for short time to flash modified value, and then press » or ^ to modify. Press « to shift flashing position , and press SET key to confirm the modified value.

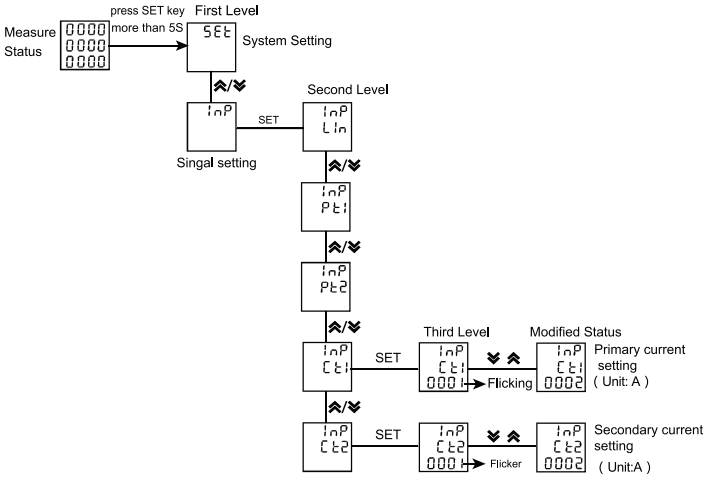
4. After the modification, press SET key more than 5 seconds to exit the user menu, enter measure status. You also can press « to exit the menu level by level.

Menu structure and function description (Note: the decimal point of the parameter in the menu is fixed decimal point)

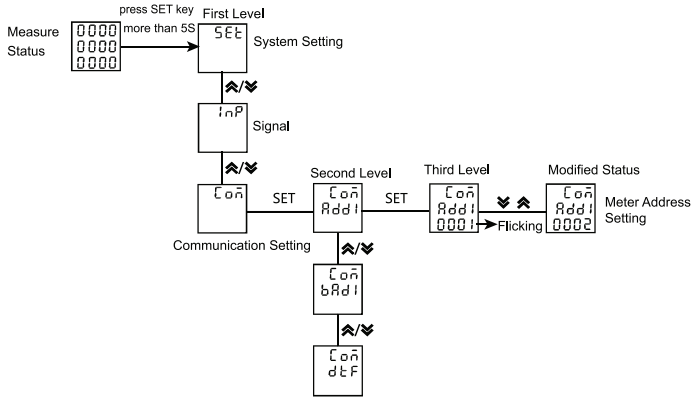
1st level	2nd level	3rd level	Description
System Setting SEt	Reset CLrE	0000	input 1234 ,the menu can be used to reset default setting.
	User Password USEr	0000	Modify password, default setting 0000, no password.
	Page Shift Time PGCH	0000	measure interface page shift time. If set as 0 , means no page shift function.
	software version USr	1.1	Software version, read only
Signal Setting InP	Net LIn	3-3 / 3-4	Set input mode, 3 phase 3 wire or 3 phase 4 wire
	Voltage ratio Pt1	0.1- 999.9	Primary voltage, unit KV
	Voltage ratio Pt2	10.0 - 999.9	Secondary voltage, unit KV
	Current Ratio Ct1	1-9999	Primary current, unit A
	Current Ratio Ct2	1.0 - 999.9	Secondary current, unit A
Communication Setting Con	Address Add	1-247	Meter address range
	Baud Rate brd	1K2/2K4/ 4K8/9K6	Baud Rate: 1k2 : 1200, 2k4 : 2400, 4k8: 4800, 9k6 : 9600
	Data Sequence dtF	H-L / L-H	High register is in front or low register is in front
	Parity bit PrtY	no/EVEn/odd	No parity / even parity / odd parity
Alarm Setting AL	Alarm mode Ad1	0-58	When value is DO, it is remote control mode, otherwise it is alarm mode, please refer to alarm parameter table .
	Alarm value unit Ut1	1/K/M	1: means international standard unit, K: 1000 times of standard unit, M: 1000000 times of standard unit.
	Alarm value AL1	0-999.9	1st alarm value setting (unit is standard display unit)
	Alarm hysteresis value HY1	0-999.9	1st alarm hysteresis value setting
	Alarm relay selection oUt1	rLY1/rLY2	1st alarm relay function
	Alarm delay dLA1	0-99.9	Alarm action delay time, unit: second
	Alarm reset time dLb1	0-99.9	Alarm action reset time, unit: second
2nd alarm related parameter setting method refer to 1st alarm setting.			

Note:Example of menu modification

Eg1: Method of setting current ratio



Eg 2: Method of setting communication address



■ Output function

1. DO1, DO2 function can be used for remote control electrical equipment . If use this function, set alarm mode as 0 (DO) the alarm mode should be selected "0" (DO). otherwise DO1, DO2 act as AL1, AL2 alarm output . DO1 and DO2 function control parameter only can be set by RS485 communicaiton.

2.Communication function (communication protocol is offered separtely)

3. The alarm function, after power on, the meter runs stably for more than 5S, then alarm starts to operate.

Alarm output parameters table

No.	Item	ON/OFF output (low alarm) code	ON/OFF output (high alarm) code
1	Ua(A phase voltage)	1 (UaL)	2 (UaH)
2	Ub(B phase voltage)	3 (UbL)	4 (UbH)
3	Uc(C phase voltage)	5 (UcL)	6 (UcH)
4	U(A、B、C any phase voltage)	7 (UL)	8 (UH)
5	Uab(AB line voltage)	9 (UabL)	10 (UabH)
6	Uca(CA line voltage)	11 (UcaL)	12 (UcaH)
7	Ubc(BC line voltage)	13 (UbcL)	14 (UbcH)
8	UL(AB、BC、CA any line voltage)	15 (ULL)	16 (ULH)
9	Ia(A phase current)	17 (IaL)	18 (IaH)
10	Ib(B phase current)	19 (IbL)	20 (IbH)
11	Ic(C phase current)	21 (IcL)	22 (IcH)
12	I(A、B、C any phase current)	23 (IL)	24 (IH)
13	P(Total active power)	25 (PL)	26 (PH)
14	Pa(A phase active power)	27 (PaL)	28 (PaH)
15	Pb (B phase active power)	29 (PbL)	30 (PbH)
16	Pc(C phase active power)	31 (PcL)	32 (PcH)
17	Q(Total reactive power)	33 (QL)	34 (QH)
18	Qa (A phase reactive power)	35 (QaL)	36 (QaH)
19	Qb(B phase reactive power)	37 (QbL)	38 (QbH)
20	Qc(C phase reactive power)	39 (QcL)	40 (QcH)
21	S (Total apparent power)	41 (SL)	42 (SH)
22	Sa(A phase apparent power)	43 (SaL)	44 (SaH)
23	Sb(B phase apparent power)	45 (SbL)	46 (SbH)
24	Sc(C phase apparent power)	47 (ScL)	48 (ScH)
25	PF(Total power factor)	49 (PFLL)	50 (PFLH)
26	PFa (A phase power factor)	51 (PFaL)	52 (PFaH)
27	PFb(B phase power factor)	53 (PFbL)	54 (PFbH)
28	PFc(C phase power factor)	55 (PFcL)	56 (PFcH)
29	F Frequency	57 (FL)	58 (FH)

■ Modbus communication protocol&Modbus-RTU protocol introduction

1. The meter adpots Modbus RTU communication protocol,RS485 half duplex communication, adpots 16 digit CRC check,the meter does not return for error check.

1.1 All the RS485 communication should comply with host/slave method. Under this method, information and data transmit between one host and maximum 32 slaves (monitoring equipment);

1.2 Host will initialize and control all information transmitted in RS485 communication loop.

1.3 In any case, communication can never be started from a slave.

1.4 All the RS485 communication is sending by packet . One data packet is a communication frame. One packet include 128 byte at most.

1.5 Host sending is named request, slave sending is named response.

1.6 In any case, slave can only respond to one request of host.

2. Data frame format:

Start bit	Data bit	Parity bit	Stop bit
1	8	Even Parity/odd Parity/no Parity (can be set)	1

3. Data frame format:

frame	byte	Illustration	
Slave address	1	Valid slave address range is 1-247	
Function code	1	0X03	Read one or more register values
		0X06	Write the specified value to an internal register
		0X10	Write specified value to multiple internal registers
Data address	2	data area storage location when slave executes effective order. Different variable seizes differents numbers of register, some address variable seizes two register, 4 byte data, some variable seizes one register, 2 byte data, please use according to actual situation.	
Data length	2	Data length to be read or written	
Data	variable	The slave returns the response data or the master writing data	
CRC check code	2	MODBUS-RTU mode adopts 16 bit CRC check. Sending equipment should do CRC16 calculation for each data of packet, final result is stored in check area. Receiving equipment also make CRC16 calculation for each data of packet (except check area), and compare result area with check area; only the same packet can be accepted.	

4. Abnormal communication processing

If host send a illegal data packet or host request a invalid data register, abnormal data response will happen. This abnormal data response is consisted of slave address, function code, error code and check area. When the high bit position of function code area is 1, it means the present data frame is abnormal response.

According to MODBUS communication requirement, abnormal response function code=request function code+0x80; when abnormal response, put 1 on the highest bit of function code.

For example: if host request function code is 0x04, slave response function code is 0x84.

Below table illustrates the meaning of abnormal function code:

Error code	Name	Illustration
0X01	Function code error	Meter received the unsupported function code
0X02	Variable address error	Data location designated by host exceeds range of meter, or receive illegal register operation.
0X03	Variable value error	Data value sent from host exceeds the corresponding data range of meter, or data structure is incomplete
0X04	Frame length error	Function code and communication frame length are inconsistent

5. Communication frame delay

There should be an appropriate delay between the two frame requests of the master station for the slave station to respond to the processing. When baud rate set as 9600, the recommended delay time between two host request is 300ms to ensure correct answer. If lower baud rate, more delay time.

■ Communication frame format illustration

1. Function code "03", read multi-channel register input

For example, host reads UA (A phase voltage), suppose measured A phase voltage is 220.0V. Address code of UA is 0x4000, because UA is fixed data (4 byte), seizes 2 data register, the hexadecimal data of 220.0V is 0x0000898 (2200).

Message format sent by the host: (default high bit in front)

Host sending	bytes	send information	Note
slave address	1	01	Send to slave with address 01
function code	1	03	Read register
start address	2	0x4000	start address
data length	2	0x0002	Read 2 registers (4 bytes in total)
CRC code	2	0XD1CB	CRC code calculated by the host

Message format returned by the slave response:

Slave response	bytes	return information	Note
slave address	1	01	from slave with address 01
function code	1	03	Read register
read word	1	04	2 registers (4 bytes)
register data	1	0x00	High high bit of address 0x4000 memory content
	1	0x00	High bit of address 0x4000 memory content
	1	0x08	low bit of address 0x4000 memory content
	1	0x98	low low bit of address 0x4000 memory content
CRC code	2	0xFC59	CRC code calculated by the slave

2. Function code "06": write single register

For example: Host writes fixed data, 1st alarm mode is AD1.

Suppose the address code of AD1 is 0x4900, because AD1 is fixed data, seizes 1 data register, decimalist code of 11 is 0X000B.

Message format sent by the host:

Host sending	bytes	send information	Note
slave address	1	01	Send to slave with address 01
function code	1	06	Write single register
start address	1	0x49	Register address high byte to write
	1	0x00	Low byte of register address to be written
Data to be written	1	0x00	Data high byte
	1	0x0B	Data low byte
CRC code	2	0xDE51	CRC code calculated by the host

Message format returned by the slave response correctly:

Host sending	bytes	send information	Note
slave address	1	01	Send to slave with address 01
function code	1	06	Write single register
start address	1	0x49	Register address high byte to write
	1	0x00	Low byte of register address to be written
Data to be written	1	0x00	Data high byte
	1	0x0B	Data low byte
CRC code	2	0xDE51	CRC code calculated by the host

3. Function code "10": write multiple registers

For example: Host writes fixed data, 1st alarm mode is AD1. Suppose the address code of AD1 is 0x4900, because AD1 is fixed data, seizes 1 data register, decimalist code of 11 is 0X000B.

Message format sent by the host:

Host sending	bytes	send information	Note
slave address	1	01	Send to slave with address 01
function code	1	10	Write multiple registers
start address	1	0x49	High byte of register start address of to be written
	1	0x00	low byte of register start address of to be written
Data word length to be written	1	0x00	High byte of word length of written data
	1	0x01	low byte of word length of written data
data length to be written	1	0x02	Data byte length (1 byte total)
Data to be written	1	0x00	Data high byte
	1	0x0B	Data low byte
CRC code	2	0x3F53	CRC code calculated by the host

Message format returned by the slave response correctly:

Slave response	bytes	send information	Note
slave address	1	01	from slave with address 01
function code	1	10	Write multiple registers
start address	2	0x4900	start address is 0000
Save data word length	2	0x0002	Save 2 words length data
CRC code	2	0X1795	CRC code calculated by the slave

4. The process of generating a CRC: (Can refer to program example as below)

4.1 Preset a 16 bit register as 0FFFFH(All 1), call it CRC register.

4.2 XOR the first 8-bit binary data (the first byte of the communication information frame) with the lower 8 bits of the 16-bit CRC register and put the result in the CRC register.

4.3 Shift the contents of the CRC register to the right by one bit (towards the lower bit) and fill the highest bit with 0, and check the shifted-out bit after the right shift;

4.4 If the shift-out bit is 0, repeat the third step(move to right by one bit again) . If the shift-out bit is 1, CRC register and polynomial A001 (1010 0000 0000 0001) XOR;

4.5 Repeat steps 3 and 4 until 8 times to the right, so that the entire 8-bit data has been processed;

4.6 Repeat steps 2 to 5 to process the next byte of the communication information frame;

4.7 After calculating all the bytes of the communication information frame according to the above steps, exchange the high and low bytes of the 16-bit obtained CRC register .

4.8 The final content of the CRC register is: CRC code.

Attached: CRC calculation C language source code

```
unsigned int GET_CRC(unsigned char * buf,unsigned charnum)
{
        unsigned  chari,j;
        unsigned int WCRC       =       0xffff;
        for(i=0;i<num;i++)
        {
                WCRC            ^=      (unsigned int)(buf[i]);   // Cyclic redundancy check
                for(j=0;j<8;j++)
                {
                        if(WCRC&1)
                        {
                                WCRC                    >>=     1;
                                WCRC                    ^=      0XA001;
                        }
                        else
                        WCRC                    >>=     1;
                }
        }
        return(WCRC);                           //      obtain CRC code
}
```

■ ES921 parameter address reflection table

Three-phase intelligent power meter address definition							
Read-only parameter communication list							
No.	reflection add.	Variable name	register	Data type	read/write	unit	note
1	0x4000	Phase voltage A	2	long	R	0.1V	
2	0x4002	Phase voltage B	2	long	R	0.1V	
3	0x4004	Phase voltage C	2	long	R	0.1V	
4	0x4006	Line voltage AB	2	long	R	0.1V	
5	0x4008	Line voltage BC	2	long	R	0.1V	
6	0x400a	Line voltage CA	2	long	R	0.1V	
7	0x400c	Phase current A	2	long	R	0.001A	
8	0x400e	Phase current B	2	long	R	0.001A	
9	0x4010	Phase current C	2	long	R	0.001A	
10	0x4012	Active power A	2	long	R	0.1W	
11	0x4014	Active power B	2	long	R	0.1W	
12	0x4016	Active power C	2	long	R	0.1W	
13	0x4018	Total active power	2	long	R	0.1W	
14	0x401a	Reactive power A	2	long	R	0.1var	
15	0x401c	Reactive power B	2	long	R	0.1var	
16	0x401e	Reactive power C	2	long	R	0.1var	
17	0x4020	Total reactive power	2	long	R	0.1var	
18	0x4022	Apparent power A	2	long	R	0.1VA	
19	0x4024	Apparent power B	2	long	R	0.1VA	
20	0x4026	Apparent power C	2	long	R	0.1VA	
21	0x4028	Total apparent power	2	long	R	0.1VA	
22	0x402a	Power factor A	2	long	R	0.001	
23	0x402c	Power factor B	2	long	R	0.001	
24	0x402e	Power factor C	2	long	R	0.001	
25	0x4030	Total power factor	2	long	R	0.001	
26	0x4032	Frequency	2	long	R	0.01HZ	
27	0x4034	Total Kwh	2	long	R	0.01kWh	
28	0x4036	Total Kvarh	2	long	R	0.01kvarh	
29	0x4038	Forward Kwh	2	long	R	0.01kWh	
30	0x403a	Backward Kwh	2	long	R	0.01kWh	
31	0x403c	Forward Kvarh	2	long	R	0.01kvarh	
32	0x403e	Backward Kvarh	2	long	R	0.01kvarh	

Reserve and extension							
system setting parameters list							
1	0x4800	Link mode	1	short	R	no decimal point	attached 1
2	0x4801	Voltage transform PT1	1	short	R/W	0.1kV	Fixed decimal point
3	0x4802	Voltage transform PT2	1	short	R/W	0.1V	
4	0x4803	Current transform CT1	1	short	R/W	1A	fixed decimal point
5	0x4804	Current transform CT2	1	short	R/W	0.1A	
6	0x4805	communication address 1	1	short	R/W	no decimal point	
7	0x4806	Baud rate 1	1	short	R/W		attached 2
8	0x4807	Data format 1	1	short	R/W		
9	0x4808	communication address 2	1	short	R/W		reserved
10	0x4809	Baud rate 2	1	short	R/W		
11	0x480a	Data format 2	1	short	R/W		
12	0x480b	switch output	1	short	R		attached 4
13	0x480c	switch input	1	short	R		attached 5
14	0x480d	Remote control input	1	short	R/W		attached 6
Reserve and extension							
Alarm parameters list							
1	0x4900	1st alarm mode	1	short	R/W	no decimal point	
2	0x4901	1st alarm unit	1	short	R/W		attach 3
3	0x4902	1st alarm unit value	1	short	R/W	0.1	fixed decimal point
4	0x4903	1st hysteresis value	1	short	R/W	0.1	
5	0x4904	1st alarm output mode	1	short	R	no decimal point	
6	0x4905	1st alarm action delay	1	short	R/W	0.1s	fixed decimal point
7	0x4906	1st alarm reset delay	1	short	R/W	0.1s	
The 2nd or more alarm communication addresses read from the end of 1st alarm address extension.							
Reserve and extension							

Attached 1: Wire connection mode description:

reflection address	value	Display characters	explanation
0X4800	0	3-4	3 phase 4 wire connection
	1	3-3	3 phase 3 wire connection

Attached 2: Communication baud rate

reflection address	value	Display characters	explanation
0X4805	0	1.2K	baud rate 1200bps
	1	2.4K	baud rate 2400bps
	2	4.8K	baud rate 4800bps
	3	9.6K	baud rate 9600bps
	4	19.2K	baud rate 19200bps

Attached 3: Alarm unit

reflection address	value	Display characters	explanation
0X4901、0X4908 0X4A01、0X4A05	0	1	unit is 1
	1	K	unit is K
	2	M	unit is M

Attached 4: Alarm output status indication

reflection address	Sequence No.	Alarm	explanation
0X480B	BIT2-BIT15	not used	not used
	BIT1	alarm 2	0: no alarm action
			1: alarm action
	BIT0	alarm 1	0: no alarm action
			1: alarm action

Attached 5 : Switch input status indication

reflection address	Sequence No.	Alarm	explanation
0X480C	BIT4-BIT15	not used	not used
	BIT3	switch input 4	0: disconnect
			1: connect
	BIT2	switch input 3	0: disconnect
			1: connect
	BIT1	switch input 2	0: disconnect
			1: connect
	BIT0	switch input 1	0: disconnect
			1: connect

Attached 6 : Remote control output command explanation

reflection address	Sequence No.	Alarm	explanation
0X480D	BIT2-BIT15	not used	not used
	BIT1	remote control 2	0: disconnect
			1: connect
	BIT0	remote control 1	0: disconnect
			1: connect