Author: Aaron
E-mail: aaron@acrel.cn
Web: www.acrel-electric.ke

Acrel IOT Data Forwarding Document

Version information

Version Number	Date	Author	Description
V1.0	2022-5-26	Kong Yijian	Initial sample
V2.0	2022-7-25	Kong Yijian	Adjust remote control
V3.0	2022-7-26	Kong Yijian	Newly added real-time data active push, control instruction perfect
V3.5	2022-10-11	Kong Yijian	AES encryption
V3.6	2022-11-24	Kong Yijian	Added active push of alarm information
V3.7	2022-12-09	Kong Yijian	Alarm information adjustment

Catalogue

Interface address prefix

Example： https://iot.acrel-eem.com/basic/prepayment

Return Value

The standard format of the interface return value is as follows:

```
{
     "success": "1",
     "errorCode": "4001",
     "errorMsg": "message error"
     "data": ...
}
```

Parameter Description

Parameter	Type	Instructions
success	String	Request the result. • "1" - Success • "0" - Fail
errorCode	String	Error code
errorMsg	String	Error message
data	Object	The result data, either an object or an array.

Details

Upload Meter Real-Time Data

Upload real-time meter data

1. Http mode

URI: The receiver provides the interface address
method: POST
Content- Type: application/ json

Parameter Description

Parameter	Type	Introductions
Response entity	Array<MeterRealTimeData>	Request Payload

Example

```
POST URI
[
  {
    "Pa" : 0 ,
    "Pb" : 0 ,
    "Pc" : 0 ,
    "state" : "OFFLINE" ,
    "Ua" : 99 .9 ,
    "Ub" : 100 ,
    "Uc" : 99 .9 ,
    "meterSn" : "12207013690004" ,
    "Ia" : 0 ,
    "Ib" : 0 ,
    "Ic" : 0 ,
    "P" : 0 ,
    "CreateTime" : "2022-07-08 16 :55 :00" ,
    "PF" : 1 ,
    "gatewaySn" : "12207013690004" ,
```

```
    "EPI" : 0 .9 ,
    " source"  : " REALTIME"
  },
  {
    "Pa" : 0 ,
    "Pb" : 0 ,
    "Pc" : 0 ,
    " state"  :  " OFFLINE"  ,
    "Ua" : 99 .9 ,
    "Ub" : 100 ,
    "Uc" : 99 .9 ,
    " meterSn"  :  " 12207013690001"  ,
    "Ia" : 0 ,
    "Ib" : 0 ,
    "Ic" : 0 ,
    "P" : 0 ,
    " CreateTime"  :  "2022-07-08 16 :55 :00"  ,
    "PF" : 1 ,
    " gatewaySn"  :  " 12207013690004"  ,
    "EPI" : 0 .9 ,
    " source"  : " REALTIME"
  }
]
```


2. Mqtt Mode

Mqttbroker Contents provided by you

ip :
port :

username :
password :

Qos :1

message :
example


```
[
  {
    "Pa" : 0 ,
    "Pb" : 0 ,
    "Pc" : 0 ,
    " state"  :  " OFFLINE"  ,
    "Ua" : 99 .9 ,
    "Ub" : 100 ,
    "Uc" : 99 .9 ,
    " meterSn"  :  " 12207013690004"  ,
    "Ia" : 0 ,
    "Ib" : 0 ,
    "Ic" : 0 ,
    "P" : 0 ,
    " CreateTime"  :  "2022-07-08 16 :55 :00"  ,
    "PF" : 1 ,
    " gatewaySn"  :  " 12207013690004"  ,
    "EPI" : 0 .9 ,
    " source"  : " REALTIME"
  },
  {
    "Pa" : 0 ,
```

```
        "Pb" : 0 ,
        "Pc" : 0 ,
        " state" : "OFFLINE" ,
        "Ua" : 99 .9 ,
        "Ub" : 100 ,
        "Uc" : 99 .9 ,
        " meterSn" : "12207013690001" ,
        "Ia" : 0 ,
        "Ib" : 0 ,
        "Ic" : 0 ,
        "P" : 0 ,
        " CreateTime" : "2022-07-08 16 :55 :00" ,
        "PF" : 1 ,
        " gatewaySn" : "12207013690004" ,
        "EPI" : 0 .9 ,
        " source" : " REALTIME"
    }
]
```


UploadEventData

Report alarm information

1. Http mode

```
URI : The receiver provides the interface address
Method : POST
Content- Type : application/ json
```

Parameter Description

Parameter	Type	Introductions
Response entity	EventData	Request Payload

Example


```
POST URI
{
    "createTime" : "2022-11-23 17 :25 :00" ,
    "meterSn" : "T001032" ,
    "list" : [
        {
            "code" : "UHIGH1" ,
            "level" : "1" ,
            "message" : {
                "en_US": "Overvoltage warning" ,
                "zh_CN": "Overvoltage warning，Set point value：110 .0，curren value：
{\"Ua\":\"242 .00\" ,\"Ub\":\"0\" ,\"Uc\":\"0\"}，unit：V"
            },
            "origInfo" : {
                "level" : "1" ,
                "settingValue" : "110 .0" ,
                " currentValue" : {
```

```
                        "Ua" : "242 .00" ,
                        "Ub" : "0" ,
                        "Uc" : "0"
                    }
                }
            }
        ],
        "gatewaySn" : "701000001001"
}
```


2. Mqtt mode

Mqttbroker contents provided by you

ip :
port :
username :
password :

Qos :1
message :
example


```
{
    "createTime" : "2022-11-23 17 :25 :00" ,
    "meterSn" : "T001032" ,
    "list" : [
        {
            "code" : "UHIGH1" ,
            "level" : "1" ,
            "message" : {
                "en_US": "Overvoltage warning" ,
                "zh_CN": "Overvoltage warning，Set point value：110 .0，current value：242 .00，unit
                ：V"
            },
            "origInfo" : {
                "level" : "1" ,
                "settingValue" : "110 .0" ,
                "currentValue" : "242 .00"
            }
        }
    ],
    "gatewaySn" : "701000001001"
}
```


RemoteControl

Remote control on and off

TokenInfo is required before remote control is switched on and off

URI : / entry/ home/ control
method : POST
Content- Type : application/ json
token :

Parameter Description

Parameter	Type	Introduction
Request Payload	Control	Request Payload

Return value

None

Example

```
POST https://iot.acrel-eem.com/basic/currency/entry/home/control
{
    "gatewaySn":"SYZ211105200007",
    "meterSn":"1",
    "method":"PRICESET",
    "value":{
        "PriceSharp":1.2,
        "PricePeak":1.3,
        "PriceFlat":2,
        "PriceValley":2.5
    }
}

{
    "success":"1",
    "errorCode":"",
    "errorMsg":"",
    "data":null
}
```

TokenInfo

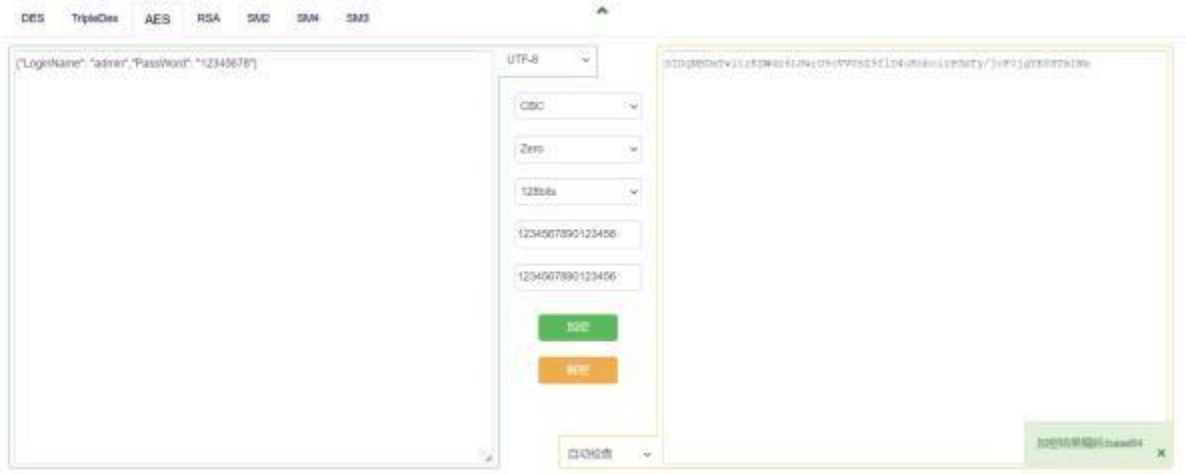
Obtaining token Information

```
URI : /auth_user/login
method : POST
application/x-www-form-urlencoded
```

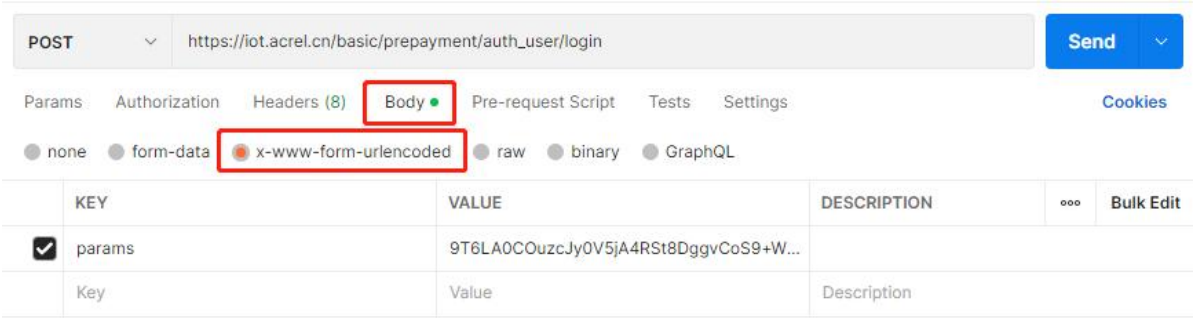
Parameter Description

Parameter	Type	Introduction
`params`	String	User name Password encrypted characters For example: {"LoginName": "admin","PassWord": "12345678"} AES is used to encrypt the json strings of the user name and password Encryption mode: CBC padding: no padding Data block: 128 bits Password: 1234567890123456 Offset: 1234567890123456 Output: base64 Character set: UTF-8 encoding

AES encryption tool address: https://the-x.cn/cryptography/Aes.aspx



The following is a screenshot of Postman's access request:



Return value

Parameter	Type	Introduction
data	Token	token message

Example

```
POST https://iot.acrel-eem.com/basic/currency/auth_user/login
{
    "success":"1",
    "errorCode":"",
    "errorMsg":"",
    "data":{
        "token":
"userweb_eyJ0eXBlIjoiSldUIiwiYWxnIjoiSFMyNTYifQ
.eyJpZCI6MSwiYWNjb3VudCI6ImFkbWlu
IiwibmFtZSI6ImFkbWluIiwiZXhwIjoxNjYyMDI5NzcLCJuYmYiOjE2NjIwMDA5NzN9
.BJXM3rumkL9MKXPr8oPcn7aD5rbCxggkK1sGfgWMGl4"
    }
}
```

Category specification

Token

token message category

Property	Type	Introduction
`token`	String	token message

MeterRealTimeData

Meter real-time/historical data

Property	Type	Introduction
`gatewaySn`	String	Gateway identification number
`meterSn`	String	Instrument address
`state`	String	ONLINE OFFLINE
`source`	String	REAL-TIME HISTORY
`CreateTime`	String	Timing
`Ua`	String	Electrical parameter data are shown in Appendix I
...		

Remote Control

Property	Type	Introduction
`gatewaySn`	String	Gateway identification number
`meterSn`	String	Instrument address
`method`	String	Control names, see Appendix II
`value`	Object	Dynamic command parameters, see Appendix II

EventData

Alarm information

Property	Type	Instroduction
`createTime`	String	Timing
`gatewaySn`	String	Gateway identification number
`meterSn`	String	Meter address
`list`	Array<EventInfo>	Alarm description

EventInfo

Alarm description

Property	Type	Instroduction
`code`	String	Message code
`level`	String	Alarm level
`message`	Object	Multilingual alarm description
`origInfo`	OrigInfo	Alarm initial data

OrigInfo

Alarm description

Property	Type	Introduction
`level`	String	Alarm level
`settingValue`	String	Alarm setting value
`currentValue`	Object	Alarm real-time value

Appendix I

Basic electrical parameter

Type	Name	Implication	Unit
Voltage	Ua	A phase voltage	V
Voltage	Ub	B phase voltage	V
Voltage	Uc	C phase voltage	V
Voltage	UPA	Phase voltage mean value	V
Voltage	Uab	AB line voltage	V
Voltage	Ubc	BC line voltage	V
Voltage	Uca	CA line voltage	V
Voltage	ULA	Line voltage mean value	V
Voltage	U	Voltage	V
Voltage	UMax	Maximum voltage	V
Voltage	UMin	Minimum voltage	V
Voltage	U0	Zero-sequence voltage	V
Voltage	U1	1st input voltage	V
Voltage	U2	2nd input voltage	V
Voltage	U3	3rd input voltage	V
Voltage	U4	4th input voltage	V
Voltage	U5	5th input voltage	V
Voltage	U6	6th input voltage	V
Voltage	U7	7th input voltage	V
Voltage	U8	8th input voltage	V
Voltage	U9	9th input voltage	V
Voltage	U10	10th input voltage	V
Voltage	U11	11th input voltage	V
Voltage	U12	12th input voltage	V
Voltage	U13	13th input voltage	V
Voltage	U14	14th input voltage	V
Voltage	U15	15th input voltage	V
Voltage	U16	16th input voltage	V
Current	Ia	A phase current	A
Current	Ib	B phase current	A

Type	Name	Implication	Unit
Current	Ic	C phase Current	A
Current	IPA	Phase current mean value	A
Current	Iab	AB Line Current	A
Current	Ibc	BC Line Current	A
Current	Ica	CA Line Current	A
Current	ILA	Line current mean value	A
Current	I	Current	A
Current	IMax	Maximum current current	A
Current	IMin	Minimum current current	A
Current	I0	Zero sequence current	A
Current	IN	Neutral line current	A
Current	I1	1st input current	A
Current	I2	2nd input current	A
Current	I3	3rd input current	A
Current	I4	4th input current	A
Current	I5	5th input current	A
Current	I6	6th input current	A
Current	I7	7th input current	A
Current	I8	8th input current	A
Current	I9	9th input current	A
Current	I10	10th input current	A
Current	I11	11th input current	A
Current	I12	12th input current	A
Current	I13	13th input current	A
Current	I14	14th input current	A
Current	I15	15th input current	A
Current	I16	16th input current	A
Leakage current	Lg	Leakage current	mA
Leakage current	Lg1	Leakage current 1	mA
Leakage current	Lg2	Leakage current 2	mA

Type	Name	Implication	Unit
Leakage current	Lg3	Leakage current 3	mA
Leakage current	Lg4	Leakage current 4	mA
Leakage current	Lg5	Leakage current 5	mA
Leakage current	Lg6	Leakage current 6	mA
Leakage current	Lg7	Leakage current 7	mA
Leakage current	Lg8	Leakage current 8	mA
Leakage current	Lg9	Leakage current 9	mA
Leakage current	Lg10	Leakage current 10	mA
Leakage current	Lg11	Leakage current 11	mA
Leakage current	Lg12	Leakage current 12	mA
Leakage current	Lg13	Leakage current 13	mA
Leakage current	Lg14	Leakage current 14	mA
Leakage current	Lg15	Leakage current 15	mA
Leakage current	Lg16	Leakage current 16	mA
Power	P	Total active power	kW
Power	Pa	A Phase active power	kW
Power	Pb	B Phase active power	kW
Power	Pc	C Phase active power	kW
Power	Q	Total reactive power	kVar
Power	Qa	A phase reactive power	kVar
Power	Qb	B phase reactive power	kVar
Power	Qc	C phase reactive power	kVar
Power	S	Total apparent power	kVA
Power	Sa	A phase apparent power	kVA
Power	Sb	B phase apparent power	kVA
Power	Sc	C phase apparent power	kVA
Power	PF	Over power factor	
Power	PFa	A phase power factor	
Power	PFb	B phase power factor	
Power	PFc	C phase power factor	

Type	Name	Implication	Unit
Power	P1	1st power input	kW
Power	P2	2nd power input	kW
Power	P3	3rd power input	kW
Power	P4	4th power input	kW
Power	P5	5th power input	kW
Power	P6	6th power input	kW
Power	P7	7th power input	kW
Power	P8	8th power input	kW
Power	P9	9th power input	kW
Power	P10	10th power input	kW
Power	P11	11th power input	kW
Power	P12	12th power input	kW
Power	P13	13th power input	kW
Power	P14	14th power input	kW
Power	P15	15th power input	kW
Power	P16	16th power input	kW
Unbalance rate	Uub	Voltage unbalance	%
Unbalance rate	Uaub	A phase voltage unbalance rate	%
Unbalance rate	Ubub	B phase voltage unbalance rate	%
Unbalance rate	Ucub	C phase voltage unbalance rate	%
Unbalance rate	Iub	Current unbalance	%
Unbalance rate	Iaub	A phase current unbalance rate	%
Unbalance rate	Ibub	B phase current unbalance rate	%
Unbalance rate	Icub	C phase current unbalance rate	%
Frequency	Fr	Frequency	Hz
Ratio	PT	PT	
Ratio	CT	CT	
Phase angle	UaAng	Uab/Ua Phase angle	◦
Phase angle	UbAng	Ub Phase angle	◦
Phase angle	UcAng	Ucb/Uc Phase angle	◦

Type	Name	Implication	Unit
Phase angle	IaAng	Ia Phase angle	°
Phase angle	IbAng	Ib Phase angle	°
Phase angle	IcAng	Ic Phase angle	°
Temperature	Temp	Temperature	℃
Temperature	TempA	A phase Temperature	℃
Temperature	TempB	B phase Temperature	℃
Temperature	TempC	C phase Temperature	℃
Temperature	TempN	N phase Temperature	℃
Temperature	Temp1	Temperature1	℃
Temperature	Temp2	Temperature2	℃
Temperature	Temp3	Temperature3	℃
Temperature	Temp4	Temperature4	℃
Temperature	Temp5	Temperature5	℃
Temperature	Temp6	Temperature6	℃
Temperature	Temp7	Temperature7	℃
Temperature	Temp8	Temperature8	℃
Temperature	Temp9	Temperature9	℃
Temperature	Temp10	Temperature10	℃
Temperature	Temp11	Temperature11	℃
Temperature	Temp12	Temperature12	℃
Temperature	Temp13	Temperature13	℃
Temperature	Temp14	Temperature14	℃
Temperature	Temp15	Temperature15	℃
Temperature	Temp16	Temperature16	℃
Humidity	Humi	Humidity	%
Humidity	Humi1	Humidity1	%
Humidity	Humi2	Humidity2	%
Humidity	Humi3	Humidity3	%
Humidity	Humi4	Humidity4	%
Humidity	Humi5	Humidity5	%

Type	Name	Implication	Unit
Humidity	Humi6	Humidity6	%
Humidity	Humi7	Humidity7	%
Humidity	Humi8	Humidity8	%
Range	Vrange	Voltage Range	V
Range	Irange	Current Range	I
Wiring system	Line	Wiring system	
Load rate	LF	Load rate	%

Electric energy

Type	Name	Name	Unit
Active electric energy	EP	Immediate combined active total electric power	kWh
Active electric energy	EPJ	Immediate combined active tip electric power	kWh
Active electric energy	EPF	Immediate combined active peak electric power	kWh
Active electric energy	EPP	Immediate combined active flat power	kWh
Active electric energy	EPG	Immediate combined valley power	kWh
Active electric energy	EPI	Immediate positive total active power	kWh
Active electric energy	EPIJ	Immediate positive active tip power	kWh
Active electric energy	EPIF	Immediate positive active peak power	kWh
Active electric energy	EPIP	Immediate positive active power	kWh
Active electric energy	EPIG	Immediate positive active valley power	kWh
Active electric energy	EPE	Immediate Reverse total active power	kWh
Active electric energy	EPEJ	Immediate reverse active tip electric power	kWh
Active electric energy	EPEF	Immediate reverse active peak power	kWh
Active electric energy	EPEP	Immediate reverse active flat power	kWh
Active electric energy	EPEG	Immediate reverse active valley power	kWh
Reactive electric energy	EQ	Immediate combined reactive total power	kWh
Reactive electric energy	EQJ	Immediate combined reactive tip power	kWh
Reactive electric energy	EQF	Immediate combined reactive peak power	kWh
Reactive electric energy	EQP	Immediate combined reactive flat power	kWh
Reactive electric energy	EQG	Immediate combined reactive valley power	kWh
Reactive electric energy	EQL	Immediate positive total reactive power	kWh
Reactive electric energy	EQLJ	Immediate positive reactive tip power	kWh
Reactive electric energy	EQLF	Immediate positive reactive peak power	kWh

Reactive electric energy	EQLP	Immediate positive reactive flat power	kWh
Reactive electric energy	EQLG	Immediate positive reactive valley power	kWh
Reactive electric energy	EQC	Immediate reverse total reactive power	kWh
Reactive electric energy	EQCJ	Immediate reverse reactive tip power	kWh
Reactive electric energy	EQCF	Immediate reverse reactive peak power	kWh
Reactive electric energy	EQCP	Immediate reverse reactive flat power	kWh
Reactive electric energy	EQCG	Immediate reverse reactive valley power	kWh

Type	Name	Implication	Unit
Active electrical power	EPI1	1st positive active power	kWh
Active electrical power	EPI2	2nd positive active power	kWh
Active electrical power	EPI3	3rd positive active power	kWh
Active electrical power	EPI4	4th positive active power	kWh
Active electrical power	EPI5	第5th positive active power	kWh
Active electrical power	EPI6	6th positive active power	kWh
Active electrical power	EPI7	7th positive active power	kWh
Active electrical power	EPI8	8th positive active power	kWh
Active electrical power	EPI9	9th positive active power	kWh
Active electrical power	EPI10	10th positive active power	kWh
Active electrical power	EPI11	11th positive active power	kWh
Active electrical power	EPI12	12th positive active power	kWh
Active electrical power	EPI13	13th positive active power	kWh
Active electrical power	EPI14	14th positive active power	kWh
Active electrical power	EPI15	15th positive active power	kWh
Active electrical power	EPI16	16th positive active power	kWh
Active electrical power	EPE1	1st reverse active power	kWh
Active electrical power	EPE2	2nd reverse active power	kWh
Active electrical power	EPE3	3rd reverse active power	kWh
Active electrical power	EPE4	4th reverse active power	kWh
Active electrical power	EPE5	5th reverse active power	kWh
Active electrical power	EPE6	6th reverse active power	kWh
Active electrical power	EPE7	7th reverse active power	kWh

Active electrical power	EPE8	8th reverse active power	kWh
Active electrical power	EPE9	9th reverse active power	kWh
Active electrical power	EPE10	10th reverse active power	kWh
Active electrical power	EPE11	11th reverse active power	kWh
Active electrical power	EPE12	12th reverse active power	kWh
Active electrical power	EPE13	13th reverse active power	kWh
Active electrical power	EPE14	14th reverse active power	kWh

Type	Name	Implication	单位Unit
Active electrical power	EPE15	15th reverse active power	kWh
Active electrical power	EPE16	16th reverse active power	kWh
Reactive electric power	EQL1	1st positive reactive power	kWh
Reactive electric power	EQL2	2nd positive reactive power	kWh
Reactive electric power	EQL3	3rd positive reactive power	kWh
Reactive electric power	EQL4	4th positive reactive power	kWh
Reactive electric power	EQL5	5th positive reactive power	kWh
Reactive electric power	EQL6	6th positive reactive power	kWh
Reactive electric power	EQL7	7th positive reactive power	kWh
Reactive electric power	EQL8	8th positive reactive power	kWh
Reactive electric power	EQL9	9th positive reactive power	kWh
Reactive electric power	EQL10	10th positive reactive power	kWh
Reactive electric power	EQL11	11th positive reactive power	kWh
Reactive electric power	EQL12	12th positive reactive power	kWh
Reactive electric power	EQL13	13th positive reactive power	kWh
Reactive electric power	EQL14	14th positive reactive power	kWh
Reactive electric power	EQL15	15th positive reactive power	kWh
Reactive electric power	EQL16	16th positive reactive power	kWh
Reactive electric power	EQC1	1st reverse reactive power	kWh
Reactive electric power	EQC2	2nd reverse reactive power	kWh
Reactive electric power	EQC3	3rd reverse reactive power	kWh
Reactive electric power	EQC4	4th reverse reactive power	kWh
Reactive electric power	EQC5	5th reverse reactive power	kWh

Reactive electric power	EQC6	6th reverse reactive power	kWh
Reactive electric power	EQC7	7th reverse reactive power	kWh
Reactive electric power	EQC8	8th reverse reactive power	kWh
Reactive electric power	EQC9	9th reverse reactive power	kWh
Reactive electric power	EQC10	10th reverse reactive power	kWh
Reactive electric power	EQC11	11th reverse reactive power	kWh
Reactive electric power	EQC12	12th reverse reactive power	kWh

Type	Name	Implication	Unit
Reactive electric power	EQC13	13th reverse reactive power	kWh
Reactive electric power	EQC14	14th reverse reactive power	kWh
Reactive electric power	EQC15	15th reverse reactive power	kWh
Reactive electric power	EQC16	16th reverse reactive power	kWh
Apparent electric power	ES	Immediate total apparent electrical power	kWh

Switching, on and off

Type	Name	Implication
Input	DI0	Switching input
Input	DI1	1 Switching input 1
Input	DI2	2 Switching input 2
Input	DI3	3 Switching input 3
Input	DI4	4 Switching input 4
Input	DI5	5 Switching input 5
Input	DI6	6 Switching input 6
Input	DI7	7 Switching input 7
Input	DI8	8 Switching input 8
Input	DI9	9 Switching input 9
Input	DI10	10 Switching input 10
Input	DI11	11 Switching input 11
Input	DI12	12 Switching input 12
Input	DI13	13 Switching input 13
Input	DI14	14 Switching input 14
Input	DI15	15 Switching input 15
Input	DI16	16 Switching input 16
Input	DI17	17 Switching input 17
Input	DI18	18 Switching input 18
Input	DI19	19 Switching input 19
Input	DI20	20 Switching input 20
Input	DI21	21 Switching input 21
Input	DI22	22 Switching input 22
Input	DI23	23 Switching input 23
Input	DI24	24 Switching input 24
Input	DI25	25 Switching input 25
Input	DI26	26 Switching input 26
Input	DI27	27 Switching input 27
Input	DI28	28 Switching input 28
Input	DI29	29 Switching input 29

Type	Name	Implication
Input	DI30	30 Switching input 30
Input	DI31	31 Switching input 31
Input	DI32	32 Switching input 32
Output	DO0	Switching output
Output	DO1	Switching output 1
Output	DO2	Switching output 2
Output	DO3	Switching output 3
Output	DO4	Switching output 4
Output	DO5	Switching output 5
Output	DO6	Switching output 6
Output	DO7	Switching output 7
Output	DO8	Switching output 8
Output	DO9	Switching output 9
Output	DO10	Switching output 10
Output	DO11	Switching output 11
Output	DO12	Switching output 12
Output	DO13	Switching output 13
Output	DO14	Switching output 14
Output	DO15	Switching output 15
Output	DO16	Switching output 16
Switching	SwitchSta	On and off 0-on 1-off 0-on 1-off

Harmonic

Type	Name	Implication	Unit
Total distortion rate	UaTHD	A phase voltage total harmonic distortion	%
Total distortion rate	UbTHD	B phase voltage total harmonic distortion	%
Total distortion rate	UcTHD	C phase voltage total harmonic distortion	%
Total distortion rate	IaTHD	A phase current total harmonic distortion	%
Total distortion rate	IbTHD	B phase current total harmonic distortion	%
Total distortion rate	IcTHD	C phase current total harmonic distortion	%
Harmonic voltage	UaHV	A phase harmonic voltage	V
Harmonic voltage	UbHV	B phase harmonic voltage	V
Harmonic voltage	UcHV	C phase harmonic voltage	V
Harmonic current	IaHC	A phase harmonic current	A
Harmonic current	IbHC	B phase harmonic current	A
Harmonic current	IcHC	C phase harmonic current	A
Harmonic power	UaHP	A phase harmonic active power	KW
Harmonic power	UbHP	B phase harmonic active power	KW
Harmonic power	UcHP	C phase harmonic active power	KW
Harmonic power	UHP	Total harmonic active power	KW
Harmonic power	IaHQ	A phase harmonic reactive power	Kvar
Harmonic power	IbHQ	B phase harmonic reactive power	Kvar
Harmonic power	IcHQ	C phase harmonic reactive power	Kvar
Harmonic power	IHQ	Total harmonic reactive power	Kvar
Voltage sub-harmonic	UaHr02	A phase voltage 2nd harmonic content	%
Voltage sub-harmonic	UaHr03	A phase voltage 3rd harmonic content	%
Voltage sub-harmonic	UaHr04	A phase voltage 4th harmonic content	%
Voltage sub-harmonic	UaHr05	A phase voltage 5th harmonic content	%
Voltage sub-harmonic	UaHr06	A phase voltage 6th harmonic content	%
Voltage sub-harmonic	UaHr07	A phase voltage 7th harmonic content	%
Voltage sub-harmonic	UaHr08	A phase voltage 8th harmonic	%

		content	
Voltage sub-harmonic	UaHr09	A phase voltage 9th harmonic content	%
Voltage sub-harmonic	UaHr10	A phase voltage 10th harmonic content	%
Voltage sub-harmonic	UaHr11	A phase voltage 11th harmonic content	%

Type	Name	Implication	Unit
Voltage sub-harmonic	UaHr12	A phase voltage 12th harmonic content	%
Voltage sub-harmonic	UaHr13	A phase voltage 13th harmonic content	%
Voltage sub-harmonic	UaHr14	A phase voltage 14th harmonic content	%
Voltage sub-harmonic	UaHr15	A phase voltage 15th harmonic content	%
Voltage sub-harmonic	UaHr16	A phase voltage 16th harmonic content	%
Voltage sub-harmonic	UaHr17	A phase voltage 17th harmonic content	%
Voltage sub-harmonic	UaHr18	A phase voltage 18th harmonic content	%
Voltage sub-harmonic	UaHr19	A phase voltage 19th harmonic content	%
Voltage sub-harmonic	UaHr20	A phase voltage 20th harmonic content	%
Voltage sub-harmonic	UaHr21	A phase voltage 21th harmonic content	%
Voltage sub-harmonic	UaHr22	A phase voltage 22th harmonic content	%
Voltage sub-harmonic	UaHr23	A phase voltage 23th harmonic content	%
Voltage sub-harmonic	UaHr24	A phase voltage 24th harmonic content	%
Voltage sub-harmonic	UaHr25	A phase voltage 25th harmonic content	%
Voltage sub-harmonic	UaHr26	A phase voltage 26th harmonic content	%
Voltage sub-harmonic	UaHr27	A phase voltage 27th harmonic content	%
Voltage sub-harmonic	UaHr28	A phase voltage 28th harmonic content	%
Voltage sub-harmonic	UaHr29	A phase voltage 29th harmonic content	%
Voltage sub-harmonic	UaHr30	A phase voltage 30th harmonic content	%
Voltage sub-harmonic	UaHr31	A phase voltage 31th harmonic content	%
Voltage sub-harmonic	UbHr02	B phase voltage 2nd harmonic content	%
Voltage sub-harmonic	UbHr03	B phase voltage 3rd harmonic content	%
Voltage sub-harmonic	UbHr04	B phase voltage 4th harmonic content	%

Voltage sub-harmonic	UbHr05	B phase voltage 5th harmonic content	%
Voltage sub-harmonic	UbHr06	B phase voltage 6th harmonic content	%
Voltage sub-harmonic	UbHr07	B phase voltage 7th harmonic content	%
Voltage sub-harmonic	UbHr08	B phase voltage 8th harmonic content	%
Voltage sub-harmonic	UbHr09	B phase voltage 9th harmonic content	%
Voltage sub-harmonic	UbHr10	B phase voltage 10th harmonic content	%
Voltage sub-harmonic	UbHr11	B phase voltage 11th harmonic content	%

Type	Name	Implication	Unit
Voltage sub-harmonic	UbHr12	B phase voltage 12th harmonic content	%
Voltage sub-harmonic	UbHr13	B phase voltage 13th harmonic content	%
Voltage sub-harmonic	UbHr14	B phase voltage 14th harmonic content	%
Voltage sub-harmonic	UbHr15	B phase voltage 15th harmonic content	%
Voltage sub-harmonic	UbHr16	B phase voltage 16th harmonic content	%
Voltage sub-harmonic	UbHr17	B phase voltage 17th harmonic content	%
Voltage sub-harmonic	UbHr18	B phase voltage 18th harmonic content	%
Voltage sub-harmonic	UbHr19	B phase voltage 19th harmonic content	%
Voltage sub-harmonic	UbHr20	B phase voltage 20th harmonic content	%
Voltage sub-harmonic	UbHr21	B phase voltage 21th harmonic content	%
Voltage sub-harmonic	UbHr22	B phase voltage 22th harmonic content	%
Voltage sub-harmonic	UbHr23	B phase voltage 23th harmonic content	%
Voltage sub-harmonic	UbHr24	B phase voltage 24th harmonic content	%
Voltage sub-harmonic	UbHr25	B phase voltage 25th harmonic content	%
Voltage sub-harmonic	UbHr26	B phase voltage 26th harmonic content	%
Voltage sub-harmonic	UbHr27	B phase voltage 27th harmonic content	%
Voltage sub-harmonic	UbHr28	B phase voltage 28th harmonic content	%
Voltage sub-harmonic	UbHr29	B phase voltage 29th harmonic content	%
Voltage sub-harmonic	UbHr30	B phase voltage 30th harmonic content	%
Voltage sub-harmonic	UbHr31	B phase voltage 31th harmonic content	%
Voltage sub-harmonic	UcHr02	C phase voltage 2nd harmonic content	%
Voltage sub-harmonic	UcHr03	C phase voltage 3rd harmonic content	%
Voltage sub-harmonic	UcHr04	C phase voltage 4th harmonic content	%

Voltage sub-harmonic	UcHr05	C phase voltage 5th harmonic content	%
Voltage sub-harmonic	UcHr06	C phase voltage 6th harmonic content	%
Voltage sub-harmonic	UcHr07	C phase voltage 7th harmonic content	%
Voltage sub-harmonic	UcHr08	C phase voltage 8th harmonic content	%
Voltage sub-harmonic	UcHr09	C phase voltage 9th harmonic content	%
Voltage sub-harmonic	UcHr10	C phase voltage 10th harmonic content	%
Voltage sub-harmonic	UcHr11	C phase voltage 11th harmonic content	%

Type	Name	Implication	Unit
Voltage sub-harmonic	UcHr12	C phase voltage 12th harmonic content	%
Voltage sub-harmonic	UcHr13	C phase voltage 13th harmonic content	%
Voltage sub-harmonic	UcHr14	C phase voltage 14th harmonic content	%
Voltage sub-harmonic	UcHr15	C phase voltage 15th harmonic content	%
Voltage sub-harmonic	UcHr16	C phase voltage 16th harmonic content	%
Voltage sub-harmonic	UcHr17	C phase voltage 17th harmonic content	%
Voltage sub-harmonic	UcHr18	C phase voltage 18th harmonic content	%
Voltage sub-harmonic	UcHr19	C phase voltage 19th harmonic content	%
Voltage sub-harmonic	UcHr20	C phase voltage 20th harmonic content	%
Voltage sub-harmonic	UcHr21	C phase voltage 21th harmonic content	%
Voltage sub-harmonic	UcHr22	C phase voltage 22th harmonic content	%
Voltage sub-harmonic	UcHr23	C phase voltage 23th harmonic content	%
Voltage sub-harmonic	UcHr24	C phase voltage 24th harmonic content	%
Voltage sub-harmonic	UcHr25	C phase voltage 25th harmonic content	%
Voltage sub-harmonic	UcHr26	C phase voltage 26th harmonic content	%
Voltage sub-harmonic	UcHr27	C phase voltage 27th harmonic content	%
Voltage sub-harmonic	UcHr28	C phase voltage 28th harmonic content	%
Voltage sub-harmonic	UcHr29	C phase voltage 29th harmonic content	%
Voltage sub-harmonic	UcHr30	C phase voltage 30th harmonic content	%
Voltage sub-harmonic	UcHr31	C phase voltage 31th harmonic content	%
Current sub-harmonic	IaHr02	A phase current 2nd harmonic content	%
Current sub-harmonic	IaHr03	A phase current 3rd harmonic content	%
Current sub-harmonic	IaHr04	A phase current 4th harmonic content	%

Current sub-harmonic	IaHr05	A phase current 5th harmonic content	%
Current sub-harmonic	IaHr06	A phase current 6th harmonic content	%
Current sub-harmonic	IaHr07	A phase current 7th harmonic content	%
Current sub-harmonic	IaHr08	A phase current 8th harmonic content	%
Current sub-harmonic	IaHr09	A phase current 9th harmonic content	%
Current sub-harmonic	IaHr10	A phase current 10th harmonic content	%
Current sub-harmonic	IaHr11	A phase current 11th harmonic content	%

Type	Name	Implication	Unit
Current sub-harmonic	IaHr12	A phase current 12th harmonic content	%
Current sub-harmonic	IaHr13	A phase current 13th harmonic content	%
Current sub-harmonic	IaHr14	A phase current 14th harmonic content	%
Current sub-harmonic	IaHr15	A phase current 15th harmonic content	%
Current sub-harmonic	IaHr16	A phase current 16th harmonic content	%
Current sub-harmonic	IaHr17	A phase current 17th harmonic content	%
Current sub-harmonic	IaHr18	A phase current 18th harmonic content	%
Current sub-harmonic	IaHr19	A phase current 19th harmonic content	%
Current sub-harmonic	IaHr20	A phase current 20th harmonic content	%
Current sub-harmonic	IaHr21	A phase current 21th harmonic content	%
Current sub-harmonic	IaHr22	A phase current 22th harmonic content	%
Current sub-harmonic	IaHr23	A phase current 23th harmonic content	%
Current sub-harmonic	IaHr24	A phase current 24th harmonic content	%
Current sub-harmonic	IaHr25	A phase current 25th harmonic content	%
Current sub-harmonic	IaHr26	A phase current 26th harmonic content	%
Current sub-harmonic	IaHr27	A phase current 27th harmonic content	%
Current sub-harmonic	IaHr28	A phase current 28th harmonic content	%
Current sub-harmonic	IaHr29	A phase current 29th harmonic content	%
Current sub-harmonic	IaHr30	A phase current 30th harmonic content	%
Current sub-harmonic	IaHr31	A phase current 31th harmonic content	%
Current sub-harmonic	IbHr02	B phase current 2nd harmonic content	%
Current sub-harmonic	IbHr03	B phase current 3rd harmonic content	%
Current sub-harmonic	IbHr04	B phase current 4th harmonic content	%

Current sub-harmonic	IbHr05	B phase current 5th harmonic content	%
Current sub-harmonic	IbHr06	B phase current 6th harmonic content	%
Current sub-harmonic	IbHr07	B phase current 7th harmonic content	%
Current sub-harmonic	IbHr08	B phase current 8th harmonic content	%
Current sub-harmonic	IbHr09	B phase current 9th harmonic content	%
Current sub-harmonic	IbHr10	B phase current 10th harmonic content	%
Current sub-harmonic	IbHr11	B phase current 11th harmonic content	%

Type	Name	Implication	Unit
Current sub-harmonic	IbHr12	B phase current 12th harmonic content	%
Current sub-harmonic	IbHr13	B phase current 13th harmonic content	%
Current sub-harmonic	IbHr14	B phase current 14th harmonic content	%
Current sub-harmonic	IbHr15	B phase current 15th harmonic content	%
Current sub-harmonic	IbHr16	B phase current 16th harmonic content	%
Current sub-harmonic	IbHr17	B phase current 17th harmonic content	%
Current sub-harmonic	IbHr18	B phase current 18th harmonic content	%
Current sub-harmonic	IbHr19	B phase current 19th harmonic content	%
Current sub-harmonic	IbHr20	B phase current 20th harmonic content	%
Current sub-harmonic	IbHr21	B phase current 21th harmonic content	%
Current sub-harmonic	IbHr22	B phase current 22th harmonic content	%
Current sub-harmonic	IbHr23	B phase current 23th harmonic content	%
Current sub-harmonic	IbHr24	B phase current 24th harmonic content	%
Current sub-harmonic	IbHr25	B phase current 25th harmonic content	%
Current sub-harmonic	IbHr26	B phase current 26th harmonic content	%
Current sub-harmonic	IbHr27	B phase current 27th harmonic content	%
Current sub-harmonic	IbHr28	B phase current 28th harmonic content	%
Current sub-harmonic	IbHr29	B phase current 29th harmonic content	%
Current sub-harmonic	IbHr30	B phase current 30th harmonic content	%
Current sub-harmonic	IbHr31	B phase current 31th harmonic content	%
Current sub-harmonic	IcHr02	C phase current 2nd harmonic content	%
Current sub-harmonic	IcHr03	C phase current 3rd harmonic content	%
Current sub-harmonic	IcHr04	C phase current 4th harmonic content	%

Current sub-harmonic	IcHr05	C phase current 5th harmonic content	%
Current sub-harmonic	IcHr06	C phase current 6th harmonic content	%
Current sub-harmonic	IcHr07	C phase current 7th harmonic content	%
Current sub-harmonic	IcHr08	C phase current 8th harmonic content	%
Current sub-harmonic	IcHr09	C phase current 9th harmonic content	%
Current sub-harmonic	IcHr10	C phase current 10th harmonic content	%
Current sub-harmonic	IcHr11	C phase current 11th harmonic content	%

Type	Name	Implication	Unit
Current sub-harmonic	IcHr12	C phase current 12th harmonic content	%
Current sub-harmonic	IcHr13	C phase current 13th harmonic content	%
Current sub-harmonic	IcHr14	C phase current 14th harmonic content	%
Current sub-harmonic	IcHr15	C phase current 15th harmonic content	%
Current sub-harmonic	IcHr16	C phase current 16th harmonic content	%
Current sub-harmonic	IcHr17	C phase current 17th harmonic content	%
Current sub-harmonic	IcHr18	C phase current 18th harmonic content	%
Current sub-harmonic	IcHr19	C phase current 19th harmonic content	%
Current sub-harmonic	IcHr20	C phase current 20th harmonic content	%
Current sub-harmonic	IcHr21	C phase current 21th harmonic content	%
Current sub-harmonic	IcHr22	C phase current 22th harmonic content	%
Current sub-harmonic	IcHr23	C phase current 23th harmonic content	%
Current sub-harmonic	IcHr24	C phase current 24th harmonic content	%
Current sub-harmonic	IcHr25	C phase current 25th harmonic content	%
Current sub-harmonic	IcHr26	C phase current 26th harmonic content	%
Current sub-harmonic	IcHr27	C phase current 27th harmonic content	%
Current sub-harmonic	IcHr28	C phase current 28th harmonic content	%
Current sub-harmonic	IcHr29	C phase current 29th harmonic content	%
Current sub-harmonic	IcHr30	C phase current 30th harmonic content	%
Current sub-harmonic	IcHr31	C phase current 31th harmonic content	%

Fundamental wave

Type	Name	Implication	Unit
Fundamental wave voltage	UaFw	A phase fundamental voltage	V
Fundamental wave voltage	UbFw	B phase fundamental voltage	V
Fundamental wave voltage	UcFw	C phase fundamental voltage	V
Fundamental wave current	IaFw	A phase fundamental current	A
Fundamental wave current	IbFw	B phase fundamental current	A
Fundamental wave current	IcFw	C phase fundamental current	A
Fundamental wave power	PaFw	A phase fundamental wave active power	KW
Fundamental wave power	PbFw	B phase fundamental wave active power	KW
Fundamental wave power	PcFw	C phase fundamental wave active power	KW
Fundamental wave power	PFw	Fundamental wave total active power	KW
Fundamental wave power	QaFw	A phase fundamental wave reactive power	Kvar
Fundamental wave power	QbFw	B phase fundamental wave reactive power	Kvar
Fundamental wave power	QcFw	C phase fundamental wave reactive power	Kvar
Fundamental wave power	Qfw	Fundamental wave total reactive power	Kvar

Demand

Type	Name	Implication	Unit
Maximum daily demand	DEQCMD	Maximum positive reactive power demand of the day	Kw
Maximum daily demand	DEPEMDT	Maximum positive active power demand of the day	
Maximum monthly demand	MEPIMD	Maximum positive active power demand of the month	Kw
Maximum monthly demand	MEPIMDT	Occurrence time of the maximum positive active power demand	Month-Day Hour:Minute Example: 05-02 12:01
Maximum monthly demand	MEPIMDM	Occurrence time of maximum positive active power demand in current month	
Maximum monthly demand	MEPIMDD	Occurrence time of maximum positive active power demand in current day	
Maximum monthly demand	MEPIMDH	Occurrence time of maximum positive active power demand in current hour	
Maximum monthly demand	MEPIMDm	Occurrence time of maximum positive active power demand in current minute	
Maximum monthly demand	MEPEMD	Maximum reverse active power demand for the month	Kw
Maximum monthly demand	MEPEMDT	Occurrence time of maximum positive active power demand	
Maximum monthly demand	MEQCMD	Maximum positive reactive power requirement in the current month	Kw

Maximum monthly demand	MEQCMDT	Occurrence time of maximum positive reactive power demand in current month	
Maximum monthly demand	MEQLMD	Maximum reverse reactive power requirement in the current month	Kw
Maximum monthly demand	MEQLMDT	Occurrence time of maximum reverse reactive power demand in the current month	
Maximum daily demand	DEPIMD	Maximum positive active power demand of the day	Kw
Maximum daily demand	DEPIMDT	Occurrence time of maximum positive active power demand in the day	
Maximum daily demand	DEPEMD	Maximum reverse active power demand of the day	Kw
Maximum daily demand	DEQCMDT	Occurrence time of the maximum positive reactive power requirement	
Maximum daily demand	DEQLMD	Maximum reverse reactive power requirement of the day	Kw

Type	Name	Implication	Unit
Maximum daily demand	DEQLMDT	Occurrence time of the maximum reverse reactive power demand	
Immediate demand	EPID	Immediate positive active power demand	Kw
Immediate demand	EPED	Immediate reverse active power demand	Kw
Immediate demand	EQCD	Immediate positive reactive power demand	Kw
Immediate demand	EQLD	Immediate reverse reactive power demand	Kw

Environmental monitoring

Type	Name	Implication	Unit
Water	RWFlow	Real-time water flow	l/s
Water	TWFlow	Cumulative water flow	m^3
Fuel gas	RGFlow	Read-time fuel gas flow	m^3
Fuel gas	TGFlow	Cumulative fuel gas flow	m^3
Fuel gas	GasPre	Gas pressure	kPa
Fuel gas	GasTemp	Gas temperature	℃
Heat	SWTemp	Supply water temperature	℃
Heat	RWTemp	Return water temperature	℃
Heat	RHeat	Real-time heat	GJ/h
Heat	THeat	Cumulative heat	GJ
Steam	VTemp	Steam temperature	℃
Steam	VPre	Steam pressure	kPa
Steam	RVFlow	Real-time steam flow	t/h
Steam	TVFlow	Cumulative steam flow	t
Pressure	RPre	Real-time pressure/atmospheric pressure	kPa
Air	Lumin	illumincation intensity	LUX
Air	PM10	PM10	pg/m^3
Air	PM25	PM2.5	pg/m^3
Air	CO2	Concentration	ppm
Air	WSpeed	Wind speed	m/s
Air	WindPow	Wind power	Level
Air	WindDirect	Wind direction	
Air	WindAngle	Wind direction degree	Degree
Air	H2	Hydrogen	ppm(1ug/ml=1ppm)
Air	O2	Oxygen	ppm(1ug/ml=1ppm)
Air	SF6	Sulfur hexafluoride	ppm(1ug/ml=1ppm)
Air	Noise	Noise	dB
Water quality	pH	pH value	
Water	Disslv0	Dissolved oxygen	mg/L

quality			
Water quality	Chlor	Residual chlorine	mg/L

Type	Name	Implication	Unit
Water quality	Conduct	Conductivity of electricity	uS/cm
Water quality	Turb	Turbidity	NTU
Water quality	WTemp	Water temperature	℃
Water level	WLevel	The water level	m
Water level	WLevel1	Water level 1	m
Water level	WLevel2	Water level 2	m
Water level	WLevel3	Water level 3	m
Water level	WLevel4	Water level 4	m
Water level	WLevel5	Water level 5	m
Water level	WLevel6	Water level 6	m
Oil lever	Oleve	Oil level	mm
Oil lever	Oleve1	Oil level 1	mm
Oil lever	Oleve2	Oil level 2	mm
Oil lever	Oleve3	Oil level 3	mm
Oil lever	Oleve4	Oil level 4	mm
Oil lever	Oleve5	Oil level 5	mm
Oil lever	Oleve6	Oil level 6	mm
Others	BodySen	Body sensing	
Others	WaterIn	Flood state	
Others	Smog	Smoke state	
Others	Door	Access control status	
Global radiation	Irradiance	Total radiation	W/m2

Alarm state

Type	Name	Implication
common use	Pfault	Equipment power supply
Street lighting	LampTCF	Terminal communication failure
Street lighting	LampSICMF	The interface conversion module is faulty.
Street lighting	LampSCATF	The single-indicator capacitor is faulty.
Street lighting	LampSF	The single lamp lamp is faulty
Street lighting	LampSFF	The single lamp fuse is faulty.
Street lighting	LampSCF	he single-indicator communication is faulty
Street lighting	LampTLA	off-line alarm
Street lighting	LampTLSA	Light sensing alarm
Breaker	RlyFauSta	Fault status of circuit breaker
Electrical safe	T1FauSta	Temperature 1 probe is faulty
Electrical safe	Lg1FauSta	The leakage transformer is faulty
Electrical safe	Lg1ShortSta	The leakage transformer is short
Electrical safe	T1FauSta	Temperature 1.probe is faulty
Electrical safe	T1ShortSta	Temperature 1 Sensor is short-circuited
Electrical safe	.....	Temperature 2, 3, 4 probe fault/sensor short circuit as above
Electrical safe	CTShortSta	Transformer short circuit
Electrical safe	CTFautSta	Transformer is disconnected
Electrical safe	Lg1HIGH1	Leakage 1 over - limit warning
Electrical safe	Lg1HIGH2	Leakage 1 over limit alarm
Electrical safe	T1HIGH1	Temperature 1.exceeds the threshold
Electrical safe	T1HIGH2	Temperature 1.exceeds the threshold
Electrical safe	.....	Temperature 2, 3, 4 over-limit warning/alarm as above
Electrical safe	UHIGH1	Overvoltage warning
Electrical safe	UHIGH2	Overvoltage warning
Electrical safe	ULOW1	Undervoltage warning
Electrical safe	ULOW2	Undervoltage warning

Electrical safe	IHIGH1	Overcurrent warning
Electrical safe	IHIGH2	Overcurrent warning
Electrical safe	ShortWarning	Short circuit warning

Type	Name	Implication
Electrical safe	ArcSta	Electric arc alarm
Smoke detector	SmokeFauSta	Smoke sensing fault
Smoke detector	SmokeAlaSta	Smoke alarm
Smoke detector	SmokeTamper	Smoke sensor anti-demolition alarm
Fire fighting water	BatULow	Battery low voltage alarm
Fire fighting water	RPreHIGH	Water pressure over-limit alarm
Fire fighting water	RPreLOW	Water pressure limit alarm
Fire fighting water	WLevelHIGH	Water level exceeded alarm
Fire fighting water	WLevelLOW	Low water level alarm
Fire fighting water	BatSta	Battery power alarm
Fire fighting water	SensorFauSta	Abnormal sensor
Fire fighting water	GWFauSta	The gateway connection is abnormal.
Fire fighting water	Drainage	Water discharge alarm
可燃气体 Combustible gas	GasLOW	Low concentration alarm
Combustible gas	GasHIGH	High concentration alarm
Combustible gas	FauSta	Fault alarm
Combustible gas	BatFauSta	Battery fault
Combustible gas	OnOffSta	On and Off
Combustible gas	InvalidSta	Failure
AMC	UaHIGH1	A phase overpressure warning
AMC	UbHIGH1	B phase overpressure warning
AMC	UcHIGH1	C phase overpressure warning
AMC	PhaseALossSta	A phase is missing
AMC	PhaseBLossSta	B phase is missing

AMC	PhaseCLossSta	C phase is missing
AMC	FrHIGH	The input frequency exceeds the upper limit. Procedure
AMC	FrLOW	The input frequency is lower than the lower limit
AMC	SPDFauSta	The SPD is faulty
AMC	SPDRlYOffSta	The SPD circuit breaker is disconnected

Prepayment

Type	Name	Implication	Unit
Prepayment	Balance	Amount remaining	Yuan
Prepayment	BuyTimes	Number of purchases	
Prepayment	LoseTimes1	Number of negative controls	
Prepayment	LoseTimes2	Number of negative controls	
Prepayment	LoseTimes3	Number of negative controls	
Prepayment	CommitTimes	Allowable number	
Prepayment	CommitTimes1	Allowable number	
Prepayment	CommitTimes2	Allowable number	
Prepayment	CommitTimes3	Allowable number	
Prepayment	SwitchSta	The state of the switch 0-on 1-off 0-on 1-off	
Prepayment	SwitchSta1	The state of the switch	
Prepayment	SwitchSta2	The state of the switch	
Prepayment	SwitchSta3	The state of the switch	
Prepayment	Alarm A	Less than the alarm amount 1	Yuan
Prepayment	Alarm B	Less than the alarm amount 2	Yuan
Prepayment	Overload	Whether the current is overloaded	
Prepayment	ControlMode	Strong control switch status	
Prepayment	ControlMode1	Strong control switch status	
Prepayment	ControlMode2	Strong control switch status	
Prepayment	ControlMode3	Strong control switch status	
Prepayment	LoseMode	Negative control switch status	
Prepayment	LoseMode1	Negative control switch status	
Prepayment	LoseMode2	Negative control switch status	
Prepayment	LoseMode3	Negative control switch status	
Prepayment	TimeMode	Time control switch status	
Prepayment	TimeStatus1	The state the relay should be in in time control mode	
Prepayment	TimeStatus2	The state the relay should be in in time control mode	
Prepayment	TimeStatus3	The state the relay should be in in time control mode	
Prepayment	PrepaidSta	Charge control switch	

Type	Name	Implication	Unit
Prepayment	OweMoney	Owe	
Prepayment	PrepaidSta1	Cost control condition	
Prepayment	PrepaidSta2	Cost control condition	
Prepayment	PrepaidSta3	Cost control condition	
Prepayment	BasePowRema	Basic residual electricity	kW·h
Prepayment	WhiteCount	Number of whitelists	
Prepayment	PriceSharp	Sharp unit price	Yuan/kW· h
Prepayment	PricePeak	Peak unit price	Yuan/kW· h
Prepayment	PriceFlat	Flat unit price	Yuan/kW· h
Prepayment	PriceValley	Unit price of grain	Yuan/kW· h
Prepayment	TimeZone	Period of time	
Prepayment	TimeZoneMonth	Time zone Parameter: month	
Prepayment	TimeZoneDay	Time zone Parameter: Day	
Prepayment	TimeInterval	The first set of time, peak flat valley	
Prepayment	TimeIntervalMinute	The first set of time periods, hours	
Prepayment	TimeIntervalHour	The first set of time periods, minutes	
Prepayment	TimeIntervals	The second set of time, peak flat valley	
Prepayment	TimeIntervalMinutes	The second set of time slots, hours	
Prepayment	TimeIntervalHours	The second set of time slots, minutes	
Prepayment	PowerLimit	Power threshold value	W
Prepayment	SaleMoney	Amount of electricity purchase	Yuan
Prepayment	Overdraft	Amount of overdraft	Yuan
Prepayment	LoseMode	Switch	
Prepayment	AriConditionMode	Air conditioning mode	
Prepayment	SocketTrip	Switch off and pull out socket trip	
Prepayment	ILimit	Maximum current current	
Prepayment	HarmonicUpperLimit	Upper harmonic limit	
Prepayment	VoltagePower	The reactive power of the VSWB is one in five out	
Prepayment	HarmonicLimit	Harmonic judgment threshold one into five out	
Prepayment	MinLimit	Reactive power ratio	

Type	Name	Implication	Unit
Prepayment	Increment	Upper power increment limit	W
Prepayment	FactorLimit	Incremental factor upper limit	
Prepayment	AlarmPower	Maximum power	W
Prepayment	TotalFactor	Reactive power of air conditioner	
Prepayment	NightLimit	Nighttime power threshold	W
Prepayment	ResetTime	Closing time required	
Prepayment	CommitTime	Number of trips	
Prepayment	TimeLimit	Upper limit of permissible cooperation	
Prepayment	WaitTime	Number of detection times of low-power malignant loads	
Prepayment	PrepayMode	Pre-paid switch	
Prepayment	OpenSign	Whether to start	
Prepayment	IsHoliday	Holiday or not	
Prepayment	StartHour	Hour	
Prepayment	StartMinute	Minute	
Prepayment	TimeSet	0-7： L1 Work 8-15： L1 Holiday 16-23： L2 Work 24-31： L2 Holiday ...	
Prepayment	WhiteNo	Whitelist number	
Prepayment	Increment	Increment of power	W
Prepayment	IncreNum	Coefficient of fluctuation	
Prepayment	PfIncre	Factor of increment	
Prepayment	PfNum	Coefficient of fluctuation	
Prepayment	ControlMode	Strong control condition	

Prepayment	Line	Loop open or not	

Safe use of electricity

Electrical parameter

Type	Name	Implication	Unit
Common use	LgFauSta	Leakage fault state	
Common use	T1Fault	Temperature 1 Fault status	
Common use	.....	Temperature 2, 3, 4 as above	
Common use	RlySta	On and off state	
Breaker	RlyFauSta	Fault status of circuit breaker	
Breaker	RlyRepSta	Condition of maintenance	
Breaker	LockSta	Local Lock Status	
Breaker	AlrRcrCnt	Number of overlaps	
Breaker	RcrDly	Reclosing delay	
Breaker	RcrCnt	Number of reclosing times	
Breaker	CtrLevel	Level of control	
Fault arc	Arc	Arc measurement value	
Smoke detector	Smoke	Concentration of smoke	%
Smoke detector	Battery	Battery capacity	%
Smoke detector	BatU	Voltage of battery	V
Combustible gas	Gas	Concentration of gas	%
Combustible gas	Medium	Medium of detection	
Combustible gas	ValveState	Linkage valve condition	
Combustible gas	FanState	Linkage Fan Status	
Combustible gas	BtnState	Key Status	
Leakage current channel status	Lg1Status	Leakage channel 1 status 0: Normal 1: Early warning 2: Alarm	
Leakage current channel status	.....	Leakage channel 2, 3, 4... Same as above	

Control

Type	Method	Implication
Common use	SILENCE	Mute
Common use	SELCHK	Self-inspection
Common use	RESET	Self test reset
Breaker	RLYREPON	Open for repair
Breaker	RLYREPOFF	Maintenance and repair gate
Breaker	RLYON	Switch On
Breaker	RLYOFF	Switch Off
Breaker	FORRLYON	Forced Switch On
Breaker	FORRLYOFF	Forced Switch Off

Parameter setting

Type	Name	Implication	Unit
Common use	UHighSw	Overvoltage alarm switch	
Common use	UHighTim	Overvoltage alarm delay	s
Common use	UHighVal01	Overvoltage warning value	%
Common use	UHighVal02	Overvoltage alarm value	%
Common use	UHighDO1	Overvoltage alarm is associated with DO1	
Common use	UHighDO2	Overvoltage alarm is associated with DO2	
Breaker	UHighRlyOff	Overvoltage associated trip	
Breaker	UHighRlyRep	Overpressure associated maintenance	
Common use	ULowSw	Undervoltage alarm switch	
Common use	ULowTim	Undervoltage alarm delay	s
Common use	ULowVal01	Undervoltage warning value	%
Common use	ULowVal02	Undervoltage alarm value	%
Common use	ULowDO1	Undervoltage alarm is associated with DO1	
Common use	ULowDO2	Undervoltage alarm is associated with DO2	
Breaker	ULowRlyOff	Undervoltage associated trip	
Breaker	ULowRlyRep	Undervoltage associated maintenance	
Common use	IHighSw	Overcurrent alarm switch	
Common use	IHighTim	Overcurrent alarm delay	s
Common use	IHighVal01	Overcurrent warning value	%
Common use	IHighVal02	Overcurrent alarm value	%
Common use	IHighDO1	Overcurrent alarm is associated with DO1	
Common use	IHighDO2	Overcurrent alarm is associated with DO2	
Breaker	IHighRlyOff	Overcurrent associated trip	

Breaker	IHighRlyRep	Overcurrent associated maintenance	
Common use	PHighSw	Over power alarm switch	
Common use	PHighTim	Over-power alarm delay	s
Common use	PHighVal01	Overpower warning value	%
Common use	PHighVal02	Over power alarm value	%
Breaker	PHighRlyOff	Over-power associated trip	
Breaker	PHighRlyRep	Excessive power correlation maintenance	

Type	Name	Implication	Unit
Common use	LgHighSw	Leakage alarm switch	
Common use	LgHighTim	Leakage alarm delay	s
Common use	LgHighVal01	Leakage warning value	mA
Common use	LgHighVal02	Leakage alarm value	mA
Common use	LgHighDO1	Leakage alarm is associated with DO1	
Common use	LgHighDO2	Leakage alarm is associated with DO2	
Breaker	LgHighRlyOff	Leakage associated trip	
Breaker	LgHighRlyRep	Leakage associated maintenance	
Common use	Lg1HighSw	Leakage current 1 alarm switch	
Common use	Lg1HighTim	Leakage current 1 alarm delay	s
Common use	Lg1HighVal01	Leakage current 1 Warning value	mA
Common use	Lg1HighVal02	Leakage current 1 Alarm value	mA
Common use	Lg1HighDO1	Leakage current 1 alarm is associated with DO1	
Common use	Lg1HighDO2	Leakage current 1 alarm is associated with DO2	
	.....	Leakage current 2, 3, 4 Ditto	
Common use	THighSw	Overtemperature alarm switch	
Common use	THighTim	Overtemperature alarm delay	s
Common use	THighVal01	Overtemperature warning value	℃
Common use	THighVal02	Overtemperature alarm value	℃
Common use	THighDO1	Overtemperature alarm is associated with DO1	
Common use	THighDO2	Overtemperature alarm is associated with DO2	
Common use	T1HighSw	Temperature 1 Overtemperature alarm switch	
Common use	T1HighTim	Temperature 1 Over temperature alarm delay	s

Common use	T1HighVal01	Temperature 1 Overtemperature warning value	℃
Common use	T1HighVal02	Temperature 1 Overtemperature alarm value	℃
Common use	T1HighDO1	Temperature 1 Overtemperature alarm associated with DO1	
Common use	T1HighDO2	DO2Temperature 1 Overtemperature alarm associated with DO2	
Breaker	T1HighRlyOff	Temperature 1 Overtemperature associated trip	
Breaker	T1HighRlyRep	Temperature 1 Overtemperature associated maintenance	
	.....	Temperature 2, 3, 4 as above	

Type	Name	Implication	Unit
Fault arc	ArcStaDO1	The arc alarm is associated with DO1	
Fault arc	ArcStaDO2	The arc alarm is associated with DO2	
Fault arc	SetProCur	Current of protection	
Fault arc	SetHalfCYC	Half cycle 0-99	
Fault arc	SetSensitivity	Sensitivity 1-9	
Fire fighting water	SetRPreHIGH	Upper water pressure limit	
Fire fighting water	SetRPreLOW	Lower water pressure limit	
Fire fighting water	SetWLevelHIGH	Upper water level	
Fire fighting water	SetWLevelLOW	Lower water level	
AMC	UHighSet	Upper voltage limit	V，Numerical value, not percentage
AMC	ULowSet	Lower voltage limit	V，Numerical value, not percentage
AMC	FrHigh	Frequency input upper limit	Hz
AMC	FrLow	Frequency input lower limit	Hz

Others

Type	Name	Implication	Unit
Date	Year	Year	
Date	Month	Month	
Date	Day	Day	
Date	Hour	Hour	
Date	Minute	Minute	
Date	Second	Second	
Date	Week	Week	
	AStatus	Buzzer status	
	PStatus	Power switch status	
	FStatus	Fan Status	
	PeStatus	Power Supply Status	

	TransCap	Capacity of transformer	
	IsnRShow	Insulation resistance display value	

Appendix II

1. Pre-paid control instructions

1.1 Refresh

> REFRESH

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "REFRESH",
   "Value": {}
}
```

1.2 Sell electricity

> SALEPOWER

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "SALEPOWER",
   "Value": {
   "SaleMoney": 100.02,
   "BuyTimes": 3
}
}
```

Field name	Describe	Unit
SaleMoney	Amount of electricity purchase	Yuan
BuyTimes	Number of purchases	

1.3 Electricity price setting

> PRICESET

```
{
      "SwicthId": "SYZ21110520007",
      "MeterAddr": "1",
      "Method": "PRICESET",
      "Value": {
         "PriceSharp": 1.2,
         "PricePeak": 1.3,
         "PriceFlat": 2,
         "PriceValley": 2.5
                  }
}
```

Field name	Description	Unit
PriceSharp	Sharp unit price	Yuan
PricePeak	Peak unit price	Yuan
PriceFlat	Flat unit price	Yuan
PriceValley	Valley Unit price	Yuan

1.4 Forced closing

> FORCECLOSE

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "FORCECLOSE",
   "Value": {}
}
```

1.5 Forced switch off

> FORCEOPEN

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "FORCEOPEN",
   "Value": {}
}
```

1.6 Restoring prepaid

> RECOVERPREPAY

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "RECOVERPREPAY",
   "Value": { }
}
```

1.7Electric meter account opening

> OPENOWNER

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "OPENOWNER",
   "Value": {
      "AlarmA": 20,
      "AlarmB": 20,
      "PriceSharp": 30,
      "PricePeak": 40,
      "PriceFlat": 50,
      "PriceValley": 60,
      "Balance": 10,
      "BasePowRema": 20,
      "UserStatus": true,
      "OwePower": 100,
      "CommitTimes": 1
                        }
}
```

Field name	Describe	Unit
AlarmA	Less than the alarm amount 1	Yuan
AlarmB	Less than the alarm amount 2	Yuan
PriceSharp	Sharp unit price	Yuan
PricePeak	Peak unit price	Yuan
PriceFlat	Flat unit price	Yuan
PriceValley	Unit price of grain	Yuan
Balance	Amount remaining	Yuan
BasePowRema	Basic electric quantity	kwh
UserStatus	Account Opening Status	
OwePower	Amount owed on credit	Yuan
CommitTimes	Allowable number of times	

1.8 Cancelled electricity meter account

> CANCELOWNER

```
{
  "SwicthId": "SYZ21110520007",
  "MeterAddr": "1",
  "Method": "CANCELOWNER",
  "Value": {}
}
```

2. Intelligent micro break

1.1 Reset

> RESET

```
{
  "SwichId" : "SYZ21110520007" ,
  "MeterAddr" : "1" ,
  "Method" : "RESET" ,
  "value" : {
    "Reset" : "1"
  }
}
```

1.2 Leakage self-inspection

> SELCHK

```
{
  "SwitchId" : "SYZ21110520007" ,
  "MeterAddr" : "1" ,
  "Method" : "SELCHK" ,
  "value" : {
    "SelChk" : "1"
  }
}
```

1.3 Switch on

> SWITCH

```
{
  "SwitchId" : "SYZ21110520007" ,
  "MeterAddr" : "1" ,
  "Method" : "SWITCH" ,
  "value" : {
    "Switch" : "0"
  }
}
```

1.4 Switch off

> SWITCH

```
{

   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "SWITCH",
   "Value": {
   "Switch": "1"

   }
}
```

1.5 Open for repair

> RLYREP

```
{

   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "RLYREP",
   "Value": {
   "RlyRep": "1"

   }
}
```

1.6 Close for repair

> RLYREP

```
{

   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "RLYREP",
   "Value": {
      "RlyRep": "0"

   }
}
```

1.7 Forced Switch on

> FORCESWITCH

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "FORCESWITCH",
   "Value": {
      "ForceSwitch": "1"
   }
}
```

1.8 Forced switch off

> FORCESWITCH

```
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "FORCESWITCH",
   "Value": {
      "ForceSwitch": "0"
   }
}
```

1.9 Time control

> TIMINGSWITCH： A maximum of 30 segments are supported

Parameter Name	Description
{Tim}Type	0- Fixed time 1- Sunrise 2- Sunset
{Tim}Mode	1- Schedule of cycles 2- Time schedule
{Tim}Year	Year
{Tim}Month	Month
{Tim}Day	Day
{Tim}Hour	Hour
{Tim}Minute	Minute
{Tim}Second	Second
{Tim}Ch	Meter address
{Tim}Value	0- Open 1- Close

```
// Close 1_1 1_2 at 8:00am 0sec on July 11, 2022
```

```
{
  "SwicthId": "SYZ21110520007",
  "MeterAddr": "",
  "Method": "TIMINGSWITCH",
  "Value": {
    "Tim1Type": "0",
    "Tim1Year": "2022",
    "Tim1Month": "07",
    "Tim1Day": "11",
    "Tim1Value": "0",
    "Tim1Mode": "2",
    "Tim1Hour": "08",
    "Tim1Minute": "00",
    "Tim1Second": "00",
    "Tim1Ch": [
      "1_1",
      "1_2"
    ]
  }
}
// Close 1_1 at 8:0:00 on July 11, 2022
// Open 1_1 at 9:0:00 on July 11, 2022
{
  "SwicthId": "SYZ21110520007",
  "MeterAddr": "",
  "Method": "TIMINGSWITCH",
  "Value": {
    "Tim1Type": "0",
    "Tim1Year": "2022",
    "Tim1Month": "07",
    "Tim1Day": "11",
    "Tim1Value": "0",
    "Tim1Mode": "2",
    "Tim1Hour": "08",
    "Tim1Minute": "00",
    "Tim1Second": "00",
    "Tim1Ch": [
    "1_1"
    ],
    "Tim2Type": "0",
    "Tim2Year": "2022",
    "Tim2Month": "07",
    "Tim2Day": "11",
    "Tim2Value": "1",
    "Tim2Mode": "2",
    "Tim2Hour": "09",
    "Tim2Minute": "00",
    "Tim2Second": "00",
    "Tim2Ch": [
    "1_1"
    ]
  }
}
  // Cycle schedule to close 1_1 at 8:00am every Monday
  // Loop schedule to open 1_1 every Tuesday at 8:0:00
  {
    "SwicthId" : "SYZ21110520007" ,
    "MeterAddr" : "" ,
    " method"  :  " TIMINGSWITCH"  ,
    "value" : {
      "Tim1Type" : "0" ,
      "Tim1SunEn" : "0" ,
      "Tim1MonEn" : "1" ,
      "Tim1TueEn" : "0" ,
      "Tim1WedEn" : "0" ,
      "Tim1ThurEn" : "0" ,
      "Tim1FriEn" : "0" ,
      "Tim1SatEn" : "0" ,
      "Tim1Value" : "0" ,
      "Tim1Mode" : "1" ,
      "Tim1Hour" : "08" ,
      "Tim1Minute" : "00" ,
      "Tim1Second" : "00" ,
      "Tim1Ch" : [
        "1_1"
```

```
        ],
        "Tim2Type" : "0" ,
        "Tim2SunEn" : "0" ,
        "Tim2MonEn" : "0" ,
        "Tim2TueEn" : "1" ,
        "Tim2WedEn" : "0" ,
        "Tim2ThurEn" : "0" ,
        "Tim2FriEn" : "0" ,
        "Tim2SatEn" : "0" ,
        "Tim2Value" : "1" ,
        "Tim2Mode" : "1" ,
        "Tim2Hour" : "08" ,
        "Tim2Minute" : "00" ,
        "Tim2Second" : "00" ,
        "Tim2Ch" : [
          "1_1"
        ]
    }
}
```


1.10 PARAMETER_SETTING

> PARAMETER_SETTING

Alarm type	{ParamName}
Over-voltage	UHigh
Under-voltage	ULow
Over-current	IHigh
Over-power	PHigh
Over-Leakage current	LgHigh
Over-temperature 1	T1High
Over-temperature 2	T2High
Over-temperature 3	T3High
Over-temperature 4	T4High

```
{
   "SwicthId":"SYZ21110520007",
   "MeterAddr":"1",
   "Method":"PARAMETER_SETTING",
   "Value":{
      "{ParamName}Sw": "0",//Protection switch 0- Off 1- On
      "{ParamName}RlyOff": "1",//Associated trip 0-off 1-on
      "{ParamName}RlyRep": "0",//Associated maintenance 0-off 1-on
      "{ParamName}Tim": "50.0",//Alarm delay (seconds)
      "{ParamName}Val02": "80.0",//Alarm value
      "{ParamName}Val01": "85.0"//Alarm value
      }
}
Over-pressure example：
{
   "SwicthId": "SYZ21110520007",
   "MeterAddr": "1",
   "Method": "PARAMETER_SETTING",
   "Value": {
      "UHighSw": "0",
      "UHighRlyOff": "1",
      "UHighRlyRep": "0",
      "UHighTim": "50.0",
      "UHighVal02": "80.0",
      "UHighVal01": "85.0"
}
}
```

Author: Aaron
E-mail: aaron@acrel.cn
Web: www.acrel-electric.ke