ЭНЕРГОМЕТРИКА

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EnergoM-207
Branch Circuit Power Meter

Installation & Operation Manual
V1.16

⚠ **Danger and Warning!**

This device can be installed only by professionals.

The manufacturer shall not be responsible for any accident caused by failure to comply with the instructions in this manual.

⚠ **Risks of Electric shocks, buring or explosion**

● This device can be installed and maintained only by qualified people.

● Before operating the device, isolate the voltage input, power supply and short-circuit the secondary windings of all current transformers.

● Put all mechanical parts, doors, or covers in their original positions before energizing the device.

● Always supply the device with the correct working voltage during its operation.

Failure to take these preventive measures will cause damage to the equipment or injuries to people

CONTENTS

1. Product Introduction

1.1 Overview

EnergoM-207 Branch Circuit Power Meter is specially designed for monitoring Power supply distribution cabinet in data center, which can monitor incoming circuit and branch circuit parameters, DI/DO status, fulfill

monitoring for power supply distribution cabinet and alarming for abnormal voltage and current information. 7 inch HMI with system chart display which can best fulfill visuality and operability, customer can choose 21 to 84 branch circuit by load quantity. This EnergoM-207 also provide extra RS485 communication port which can easily connect with other systems.

1.2 Product Features:

- Module design, separate Main module, CT module, Digital Input module, can fulfill different technical requirement
- 7 Inch HMI human-computer interface, good visuality and operability
- No extra secondary contact, each DI/DO switch has separate status indicate light
- Can measuring main income and branch circuit line insulation
- Can measuring one channel temperature.
- Relay alarm function, can record more than 5000 pieces alarming information
- Measuring the KWH on 2 loop incoming and each outgoing circuit, fulfill energy management requirement
- Adopt the DC hall sensor
- RS485 communication, Modbus-RTU protocol,

1.3 HMI Human-Computer Interface

EnergoM-207 branch circuit power meter with 7 inch touch screen human-computer interface, system chart display, with best visuality and operability.

1.4 Product Composition

EnergoM-207 Branch Circuit Power Meter with module design which including Main module (EnergoM-207- M), Branch circuit hall sensors, Branch circuit insulation monitor (EnergoM-207JY), Digital Input module, HMI module.

The Branch circuit insulation monitor (EnergoM-207JY) include main unit (EnergoM-207JY-M), insulation monitor hall sensor.

According to different application to choose different configuration, following are two main typical application for reference:

■ One main incoming circuit

One main circuit

Main A

⌇2P

SPM207   SPM207

RS485

HMI
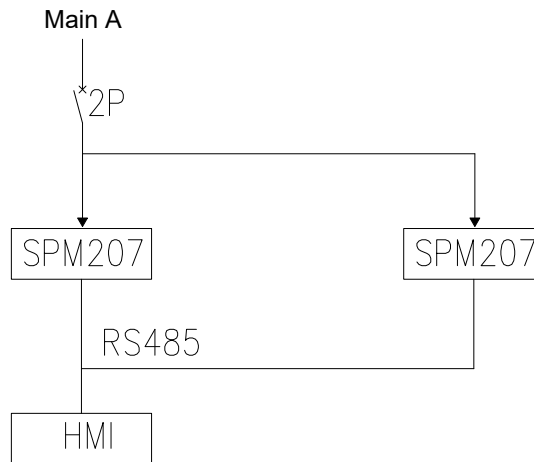
Remark:
1. In one main circuit wiring system, each EnergoM-207 measure max. 42 branch circuits.
2. One main circuit max. has 84 brahcn circuits.
3. One HMI max. connect 2pcs of EnergoM-207 main modules to monitor 84 branch circuits.

Pic. 1.1

■ Two main incoming circuit

Two main circuits

Main A   Main B

⌇2P   ⌇2P

SPM207   SPM207   SPM207   SPM207

RS485

HMI

Remark:
1. In two main circuit wiring system, each EnergoM-207 measure max. 42 branch circuits.
2. Each main circuit max. has 63 branch circuits.
3. One HMI max. connect 4pcs of EnergoM-207 main modules to monitor 126 branch circuits.

Pic. 1.2

2. Product Performance and functionality
2.1 Product Model

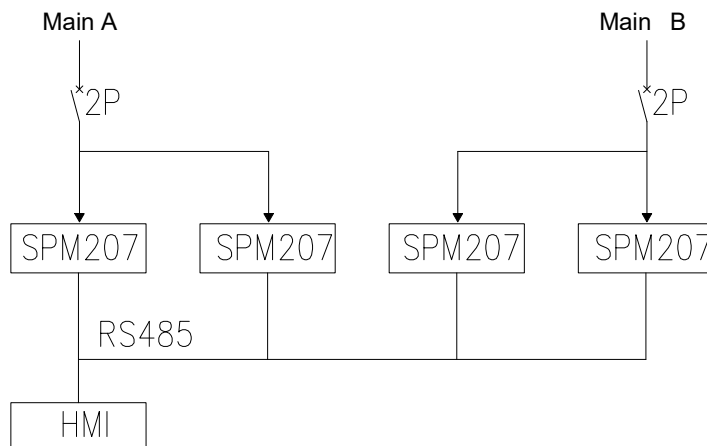| Name	EnergoM-207 Branch Circuit Power Meter	
Model	EnergoM-207-□- □- □ ① ② ③	
	① Alternative 21 or 42	21—Monitoring 21 branch circuits
		42—Monitoring 42 branch circuits
	② Optional C1, C2, C3, C4, C5	C1—Branch circuit rated current 50A
		C2—Branch circuit rated current 100A
		C3—Branch circuit rated current 200A
		C4—Branch circuit rated current 400A
		C5—Branch circuit rated current 600A
	③ Optional X1, X2, X3	X1—Rated voltage DC240V
		X2—Rated voltage DC48V
		X3—Rated voltage DC336V
	④ Optional T, L, TL	T—Measure 1 channel temperature, with PT100 sensor
		L—Measure 1 channel leakage current, rated 10mA (Primary)
		TL—Measure 1 channel temperature + 1 channel leakage current

SPM207 modules

Item	Name	Model	Remark
1	HMI	EnergoM-207V7	7 inch HMI for local display, come with embedded monitoring software
2	Main module	EnergoM-207-42-C1-X1	
3	42 channel DI module	EnergoM206K-42 (dry contact)	Branch breaker config point OF
4	42 channel DI module	EnergoM206K-42 (DC 240V)	Get voltage from branch breaker
5	42 channel DI module	EnergoM206K-42 (DC -48V)	Get voltage from branch breaker , for system DC-48V

Other accessories

Item	Name	Model	Size drawing	Remark
1	50A hall sensor	LDCT-50K1	Pic2.1	For measuring branch circuit current
2	100A hall sensor	LDCT-100K1	Pic2.1	
3	200A hall sensor	LDCT-200K1	Pic2.1	
4	10mA leakage hall sensor	LDC10M	Pic2.2	For measuring branch circuit insulation, power supply DC12V, RS485 port
5	100A hall sensor	HOS-100AQ11	Pic2.5	For measuring main income circuit current, Split core, voltage output type
6	200A hall sensor	HOS-200AQ11	Pic2.5	
7	400A hall sensor	HOS-400AK1	Pic2.6	

8	600A hall sensor	HOS-600AK1	Pic2.6	
9	800A hall sensor	HOS-800AK2	Pic2.7	
10	1600A hall sensor	HOS-1600AK4	Pic2.8	
11	24V DC relay	MY2N-J	Pic2.9	Switch HMI main/ spare power supply
12	Temperature sensor	MS6-PT100B-3000	Pic2.10	

Hall Sensor Dimension:

Unit: mm

Pic2.1	40 20.4 30 GIN OFS 10 4 3 2 1 Locating Pillar2.5 30 20 GIN OFS 9.5 20 4.5 3 18 10 4.5 10 5 OFS：Zero Adjustment GIN：Gain Adjustment Terminal Instructions： 1：Common Port 2：Output Port 3：Negative Port（-） 4：Positive Port（+）
Pic2.2	57 D23 46.5 1 2 3 4 5 5 77 20 73 23.5 34 67 2-D5 16 Terminal Instructions: 1: RS485- 2: RS485+ 3: Ground Port(G) 4: Positive Port(+) 5: Empty Terminal Port
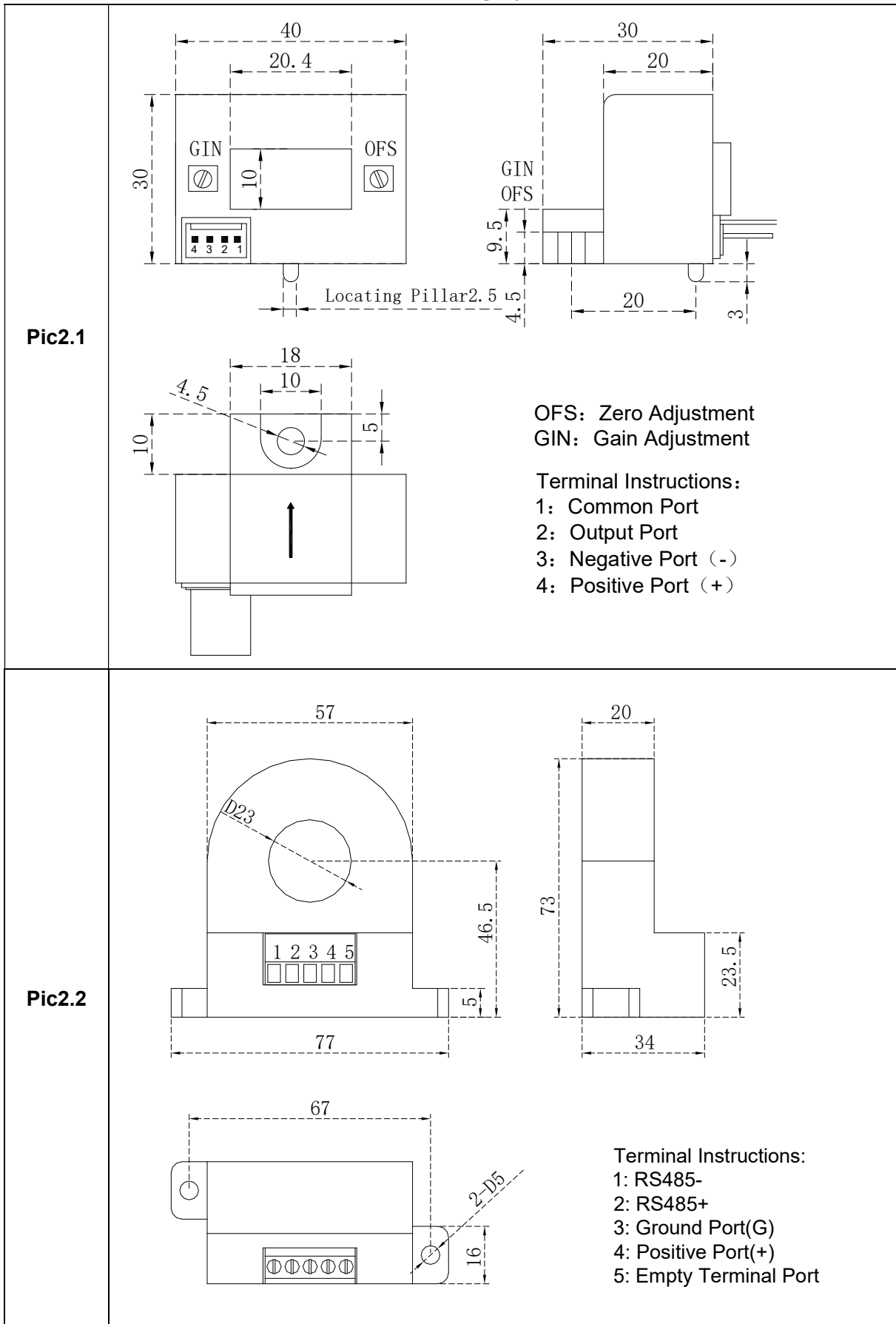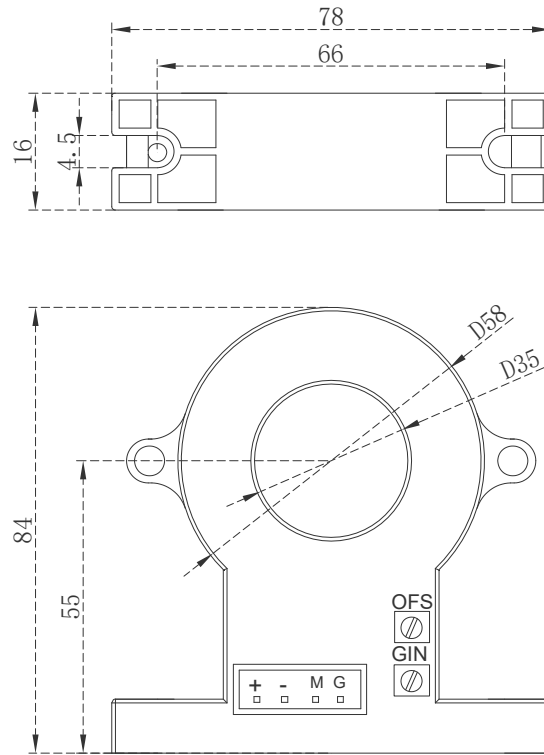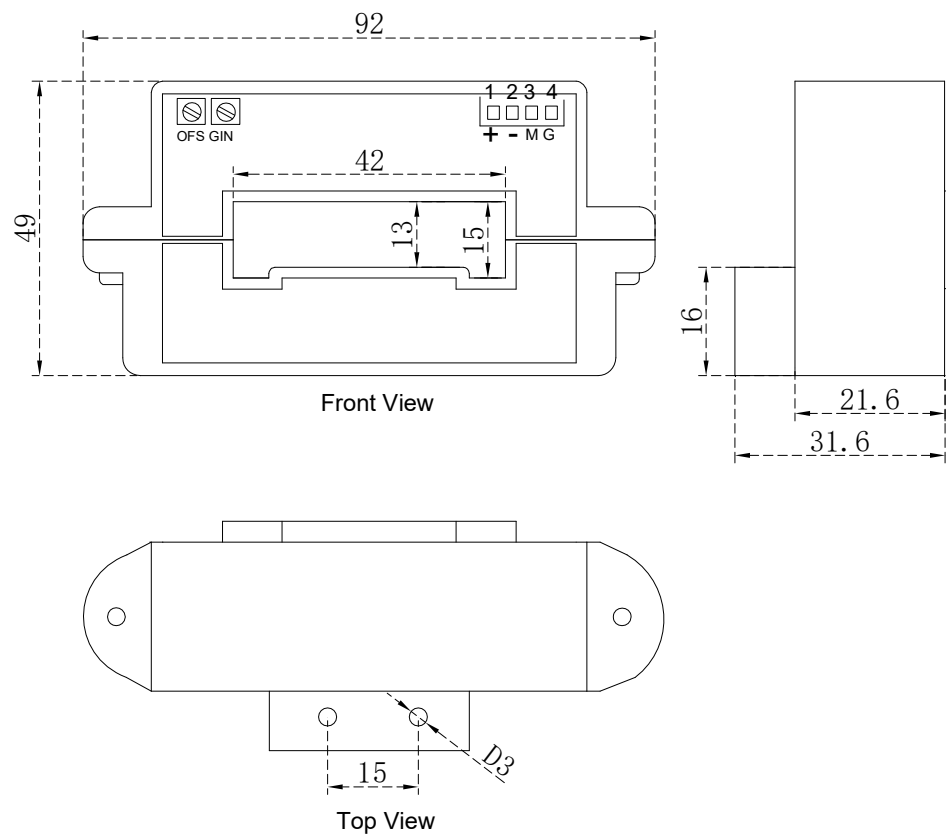
Pic2.5	
Pic2.6	 Front View Top View Use 2 nos of screw M3*20 to fix on the busbar. On the copper busbar, Make two D4 through-holes.
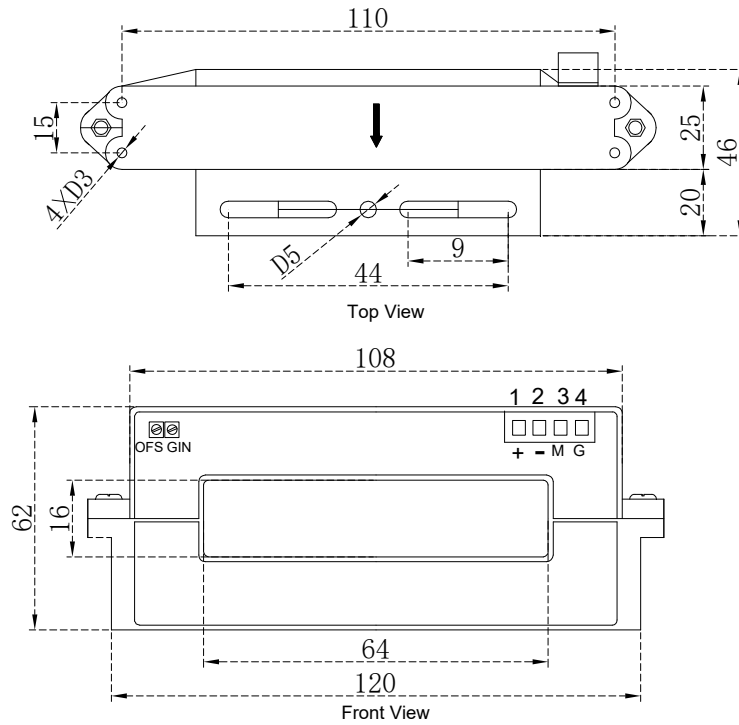
Pic2.7	Top View Front View Use one (in middle) or two (two sides) screws M5*10 fix on the copper busbar. (The copper busbar needs to be punched and tapped. The screw must be threaded through the copper busbar first. M5 nut is required for non-tapping.)
Pic2.8	OFS：Zero Adjustment GIN：Gain Adjustment Terminal Instructions： 1：Positive Port（+） 2：Negative Port（-） 3：Output Port（M） 4：Common Port（G） Use one (in middle) or two (two sides) screws M5*10 fix on the copper busbar. (The copper busbar needs to be punched and tapped. The screw must be threaded through the copper busbar first. M5 nut is required for non-tapping.)
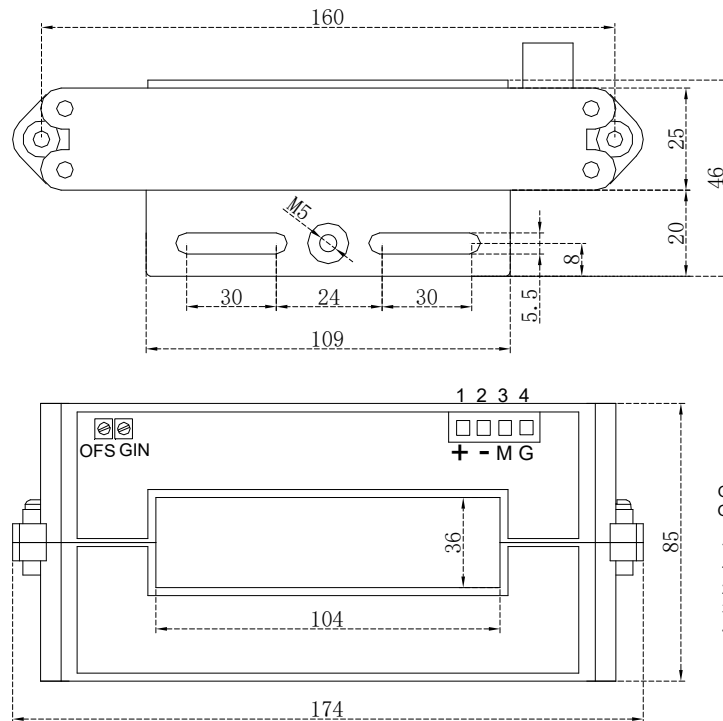
24V DC Relay Dimension:

Pic2.9	

Temperature Sensor Dimension:

Pic2.10	
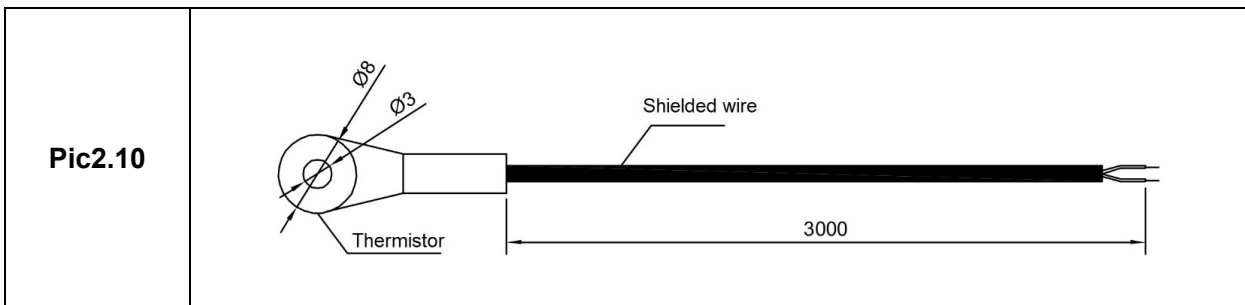
2.2 Product Function

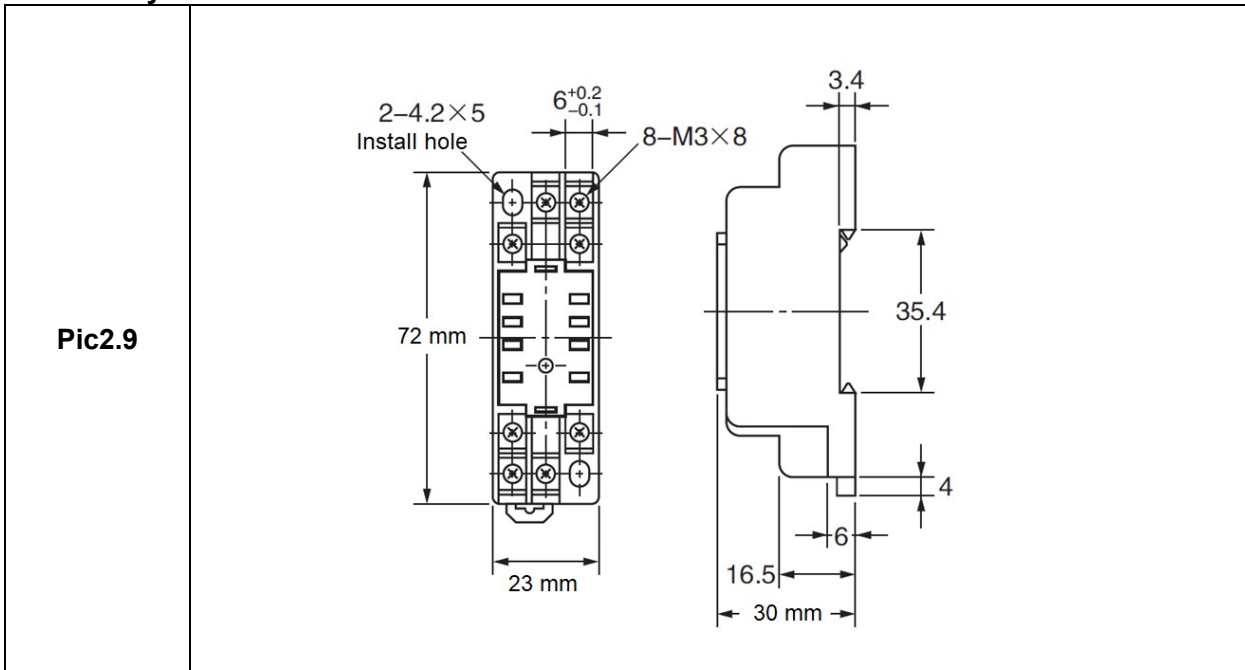| Function	Illustration
Main Incoming Circuit	
Main income measuring	Measuring voltage, and identify the polarity
Voltage to earth	Negative pole or Positive pole voltage to earth
Insulation measuring	Judging by voltage to ground
Temperature	1 channel temperature of Isolation transformer, range 0-120℃,
Income digital input ON/ OFF status	4 DI to measure the ON/ OFF status of breaker or lightning protection switch. DI dry contact.
Incoming parameters	Voltage, Current, Max current, Active power, kWh
Demand data	Demand current, max demand current, demand P, max demand P
Incoming overload alarm	2 level alarm for higher limit current: Hi-limit alarm, Hi-hi- limit alarm
Incoming underload alarm	2 level alarm for lower limit current: Lo-limit alarm, Lo-lo- limit alarm
Incoming Over Voltage alarm	Over than setting voltage value will alarm

Incoming line Under Voltage alarm	Less than setting voltage value will alarm
Insulation resistance lower limit alarm	Less than setting insulation resistance value will alarm
Temperature alarm	Over than setting temperature value will alarm
DI ON/ OFF status alarm	When status ON change to OFF, it will alarm. This alarm function can be unable by software
Branch Outgoing Circuit	
Branch circuit monitoring	Can provide 21, 42 channel outgoing line circuit for choosing
Outgoing circuit digital input ON/ OFF status	Measure the 21, or 42 channel ON/ OFF status of breaker
Branch circuit parameters	Current, max current, active power, kWh
Branch circuit demand data	Demand current, max demand current, demand P, max demand P
Branch circuit overload alarm	2 level alarm for higher limit current: Hi-limit alarm, Hi-hi- limit alarm
Branch circuit underload alarm	2 level alarm for lower limit current: Lo-limit alarm, Lo-lo- limit alarm
DI ON/OFF status alarm	When status ON change to OFF, it will alarm. This alarm function can be unable by software
Insulation resistance lower limit alarm	2 level alarm for lower limit value: Lo-limit alarm, Lo-lo- limit alarm
Others	
Display module HMI	7 Inch touch screen, resolution 800x480
Communication Port	RS485, Modbus-RTU Protocol
Relay Output	2 relay as alarm port
Event record function	HMI can record more than 5000 pieces alarming events
Setting Function	Setting parameters by HMI, such as rated current, Alarm value
Running Indication	Main module and Digital Input module with running indicate LED light
DI ON/ OFF status Indication	Switching value indicating light
Pulse output for kWh	Can be configured to main circuit kWh or branch circuit kWh

2.3 Technical Specification

Name	Illustration
Power Supply	DC48V (36~60), DC 240V (110~370), or DC336V (110~400), power consumption <20W
Mean free error time	No less than 50000 hours
Rated Voltage	DC 240V or DC48V or DC 336V optional, Range: 10%~120% Un, Accuracy 0.5%
Main Income Circuit Rated Current	100A~1600A optional, Range: 1%~120% In, Accuracy: 0.5%
Rated Outgoing Current	50A, 100A, 200A, 400A, 600A optional, Range: 1%~120% In, Accuracy: 0.5%
Active Power and KWH	Accuracy: 1.0%
Communication port	RS485
Digital Input	Main Income Circuit 4DI: dry contact DI module for branch circuit: dry or wet for option. Wet contact signal DC240V, or DC-48V

Relay Capacity	AC 250V/5A or DC 30V/5A

2.4 EMC Properties

TEST	Technical Index	Standard
Electrostatic Discharge Immunity Test	Level 3	IEC61000-4-2
Radiated Immunity Test	Level 3	IEC61000-4-3
Electrical Fast Transient/Burst Immunity Test	Level 3	IEC61000-4-4
Surge Immunity Test	Level 3	IEC61000-4-5
Power Frequency withstand voltage	Rated Insulation Voltage <300V, Test Voltage 2000V Rated Insulation Voltage <60V, Test Voltage 1000V	IEC 62052-11: 2003

2.5 Operating Environment

Item	Parameter
Application Site	Indoor
Operating temperature	-10℃~55℃
Storage temperature	-25℃~70℃
Humidity	5%~95% RH, non-condensing
IP Grade	IP20, HMI (front panel) IP65
Insulation resistance	No less than 100MΩ, IEC62052-11

3. Installation

3.1 Main module dimension
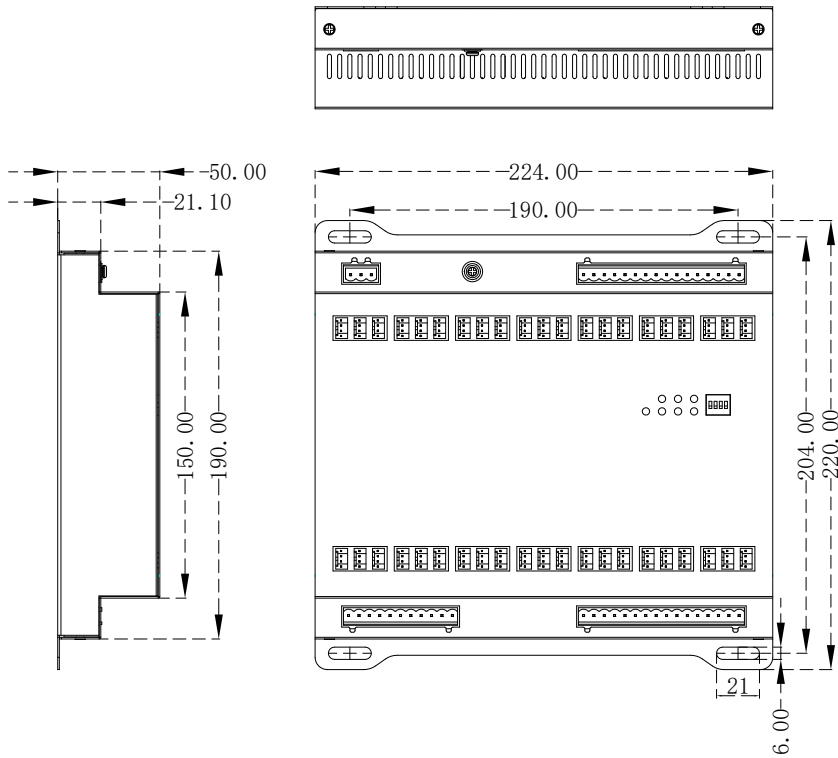
Pic. 3.1   Main Module drawing

「Note」: Use the screws to fix the main module.

3.2 DI Module dimension
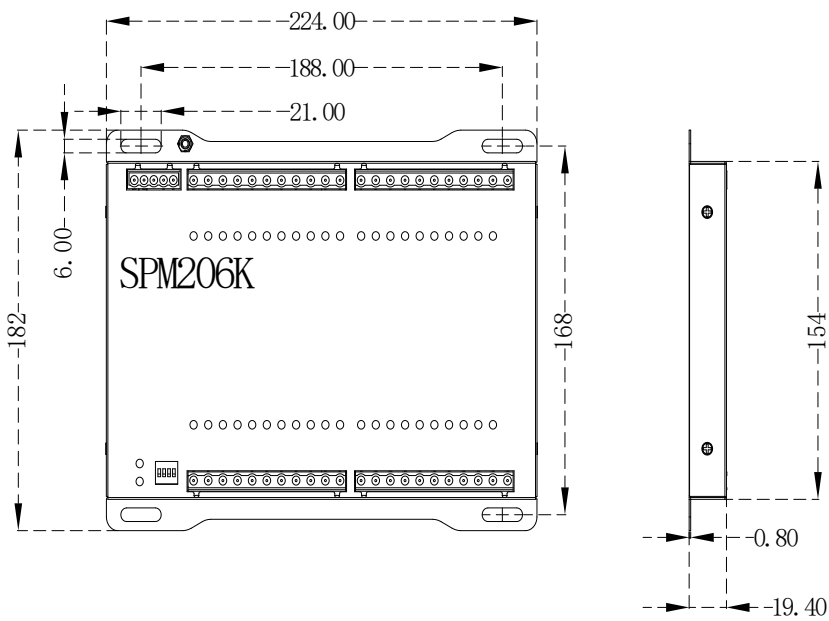
Pic. 3.2   DI Module dimension

Note:
1. DI Module fixed installation
2. Running Indication Light: Flash means normal working and on communication; Light normal ON, means normal working but no communication

DI Module Address setting
One Main Module can connect one DI Module (42DI), the address of DI module setting by dial switch, setting dial switch as following

ON

3.3 HMI dimension

Outline Dimension   Cut-out Dimension

Pic. 3.3 HMI Module

THE SCREW NAIL HEAD SHOULD NOT BE SLANT WITH THE HOOK EDGE BEFORE INSTALLATION.
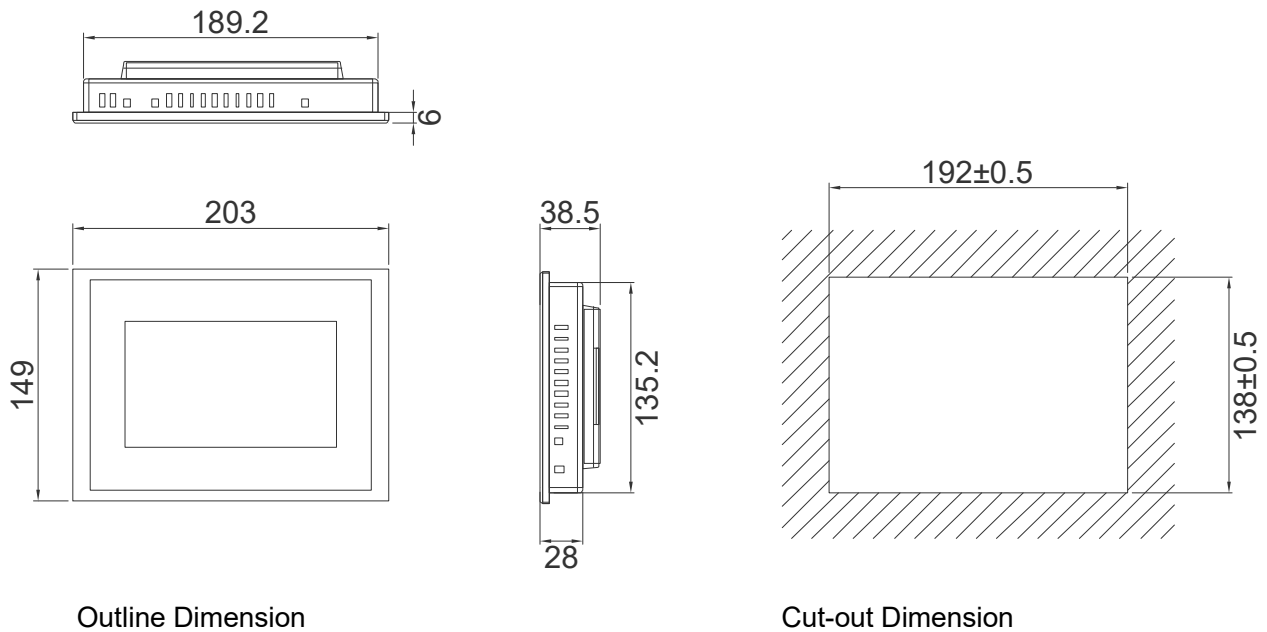
Pic. 3.4 HMI Installation

[Note]: HMI is Embedded panel mounting

4. Terminal mark and Connection Wiring

4.1 Main Module Terminals (EnergoM-207-M)

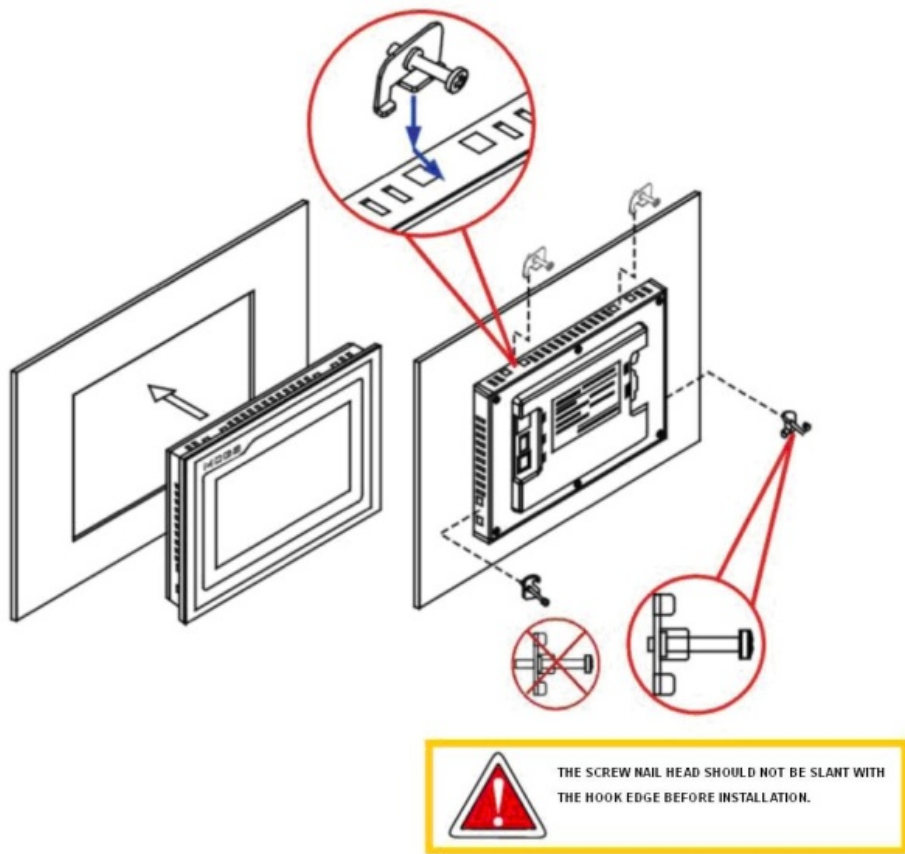| NO.	Mark	Definition	NO.	Mark	Definition
1	DC+	Power supply voltage, positive pole	20	24V-	DC24V power output
2	NC	Null	21	24V+	
3	DC-	Power supply voltage, negative pole	22	SHLD	No. 3 RS485 port, to system
4	V+	Main income voltage, positive pole	23	485C-	
5	NC	Null	24	485C+	
6	V-	Main income voltage, negative pole	25	SHLD	No. 2 RS485 port, to HMI
7	NC	Null	26	485B-	
8	PE	Earthing	27	485B+	
9	NC	Null	28	SHLD	No. 1 RS485 port, to DI module
10	+12V	Main circuit hall sensor power supply +12V	29	485A-	
11	-12V	Main circuit hall sensor power supply -12V	30	485A+	
12	I	Main circuit hall sensor current signal	31	S1	Digital input No. 1~4
13	GND	Main circuit hall sensor Earthing	32	S2	
14	IG	Main circuit leakage current signal	33	S3	
15	NC	Null	34	S4	
16	NC	Null	35	DC	DI common
17	NC	Null	36	NC	Null
18	NC	Null	37	RL22	Relay output 2
19	NC	Null	38	RL21	
			39	RL12	Reply output 1
			40	RL11	
			41	Pulse-	Pulse output
			42	Pulse+	
			43		
			44		
			45	PT-	PT100 input
			46	PT+	

4.2 DI module terminals

| NO.	Mark	Definition	NO.	Mark	Definition
1	24V+	24V power supply, positive pole	28	S22	Digital input 22
2	24V-	24V power supply, negative pole	29	S23	Digital input 23
3	SHLD	Shielded earth	30	S24	Digital input 24
4	485-	RS485 -	31	S25	Digital input 25
5	485+	RS485 +	32	S26	Digital input 26
6	S1	Digital input 1	33	S27	Digital input 27
7	S2	Digital input 2	34	S28	Digital input 28
8	S3	Digital input 3	35	S29	Digital input 29
9	S4	Digital input 4	36	S30	Digital input 30
10	S5	Digital input 5	37	S31	Digital input 31
11	S6	Digital input 6	38	S32	Digital input 32
12	S7	Digital input 7	39	S33	Digital input 33
13	S8	Digital input 8	40	S34	Digital input 34
14	S9	Digital input 9	41	S35	Digital input 35
15	S10	Digital input 10	42	S36	Digital input 36
16	S11	Digital input 11	43	S37	Digital input 37
17	S12	Digital input 12	44	S38	Digital input 38
18	S13	Digital input 13	45	S39	Digital input 39
19	S14	Digital input 14	46	S40	Digital input 40
20	S15	Digital input 15	47	S41	Digital input 41
21	S16	Digital input 16	48	S42	Digital input 42
22	S17	Digital input 17	49	SG2	S22~S42 Common
23	S18	Digital input 18			
24	S19	Digital input 19			
25	S20	Digital input 20			
26	S21	Digital input 21			
27	SG	S1~S21 Common			

4.3 HMI communication wiring

There is one special cable to connect the HMI to the RS485 of EnergoM-207-M. The communication cable DB9 is connected to the HMI, the red line is connected to 485+, the yellow line is connected to 485-, plug and the shield is connected to SHLD.

4.4 HMI power supply wiring

HMI operation power supply is 24VDC, there are 2 types of connection.
1) There is no DI module: The HMI get power 24VDC from the main module EnergoM-207-M
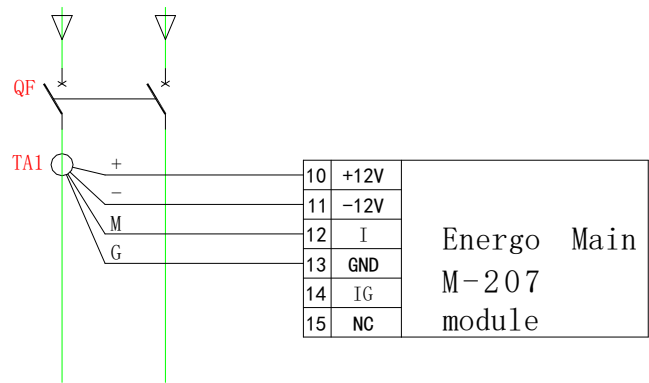2) There is DI module: The HMI get power 24VDC from the DI module
   If the system has 2 main input, The HMI gets power from the 24VDC Relay, as below pic 4-1
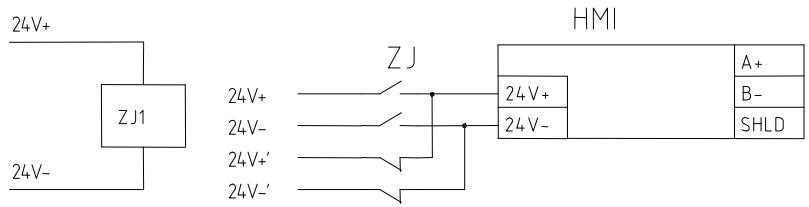
Pic. 4.1

4.5 Main income circuit hall sensor wiring

Wiring for Main Circuit Hall Sensor

10	+12V	
11	−12V	Energo Main
12	I	M-207
13	GND	module
14	IG	
15	NC	

Pic.4.2

Note:
1.   Main circuit hall sensor has 4 terminals:
Power supply positive pole (+)
Power supply negative pole (-)
Output single (M)
Common grounding (G)
2.   The EnergoM-207 main module terminal No. 10, 11, 13 provide power supply to the hall sensor. The terminals (M) connect
3.   The arrow direction on hall sensor is the DC current flow direction (positive to negative), DC-48V install to Negative pole.
to Terminal No. 12

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4.6 Branch circuit hall sensor wiring
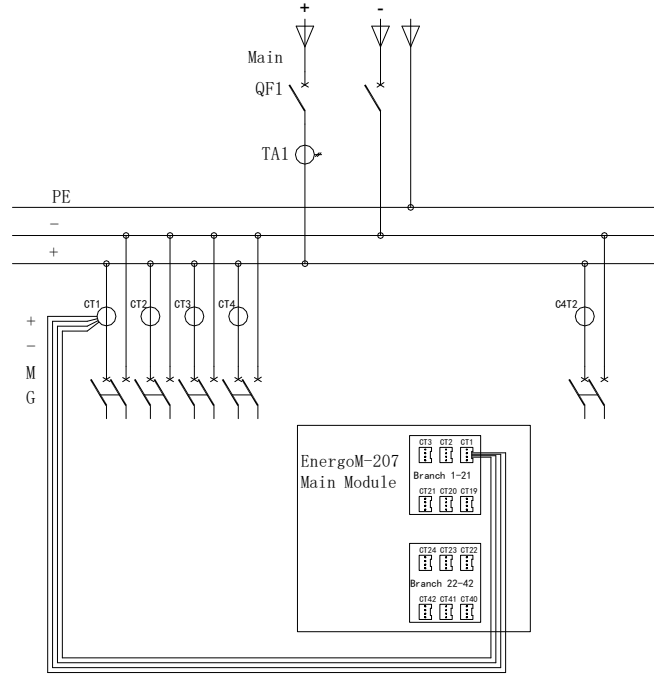
Pic.4.3

Note:
1. One EnergoM-207 main module can connect 42pcs of branch circuit hall sensors. The hall sensor has 4 terminals (+), (-), (M), (G). It has a cable to connect with main module. (Cable model No.: KF2510/4P)
2. The arrow direction on hall sensor is the DC current flow direction (positive to negative), DC-48V install to Negative pole.

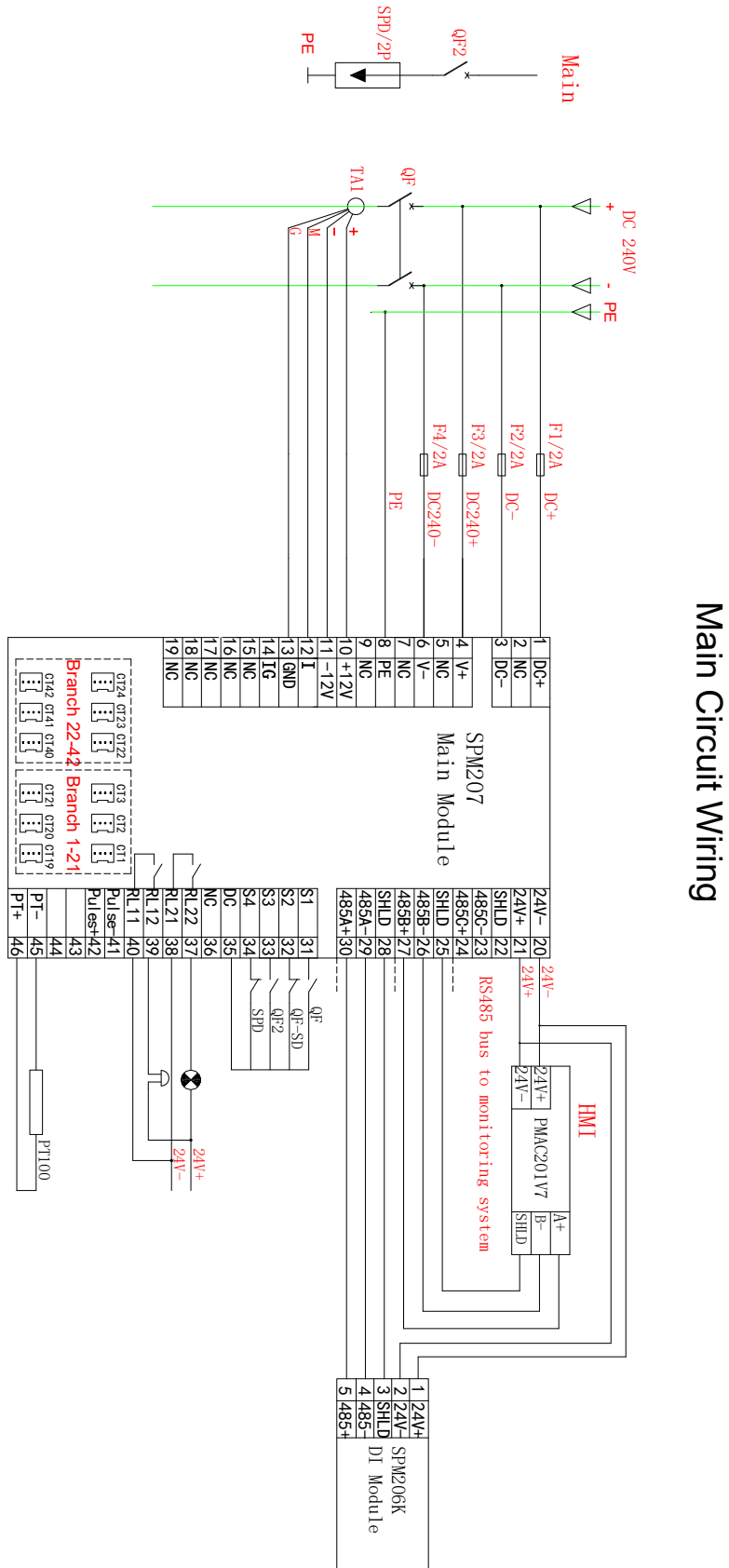# 4.7 Insulation monitor hall sensor wiring
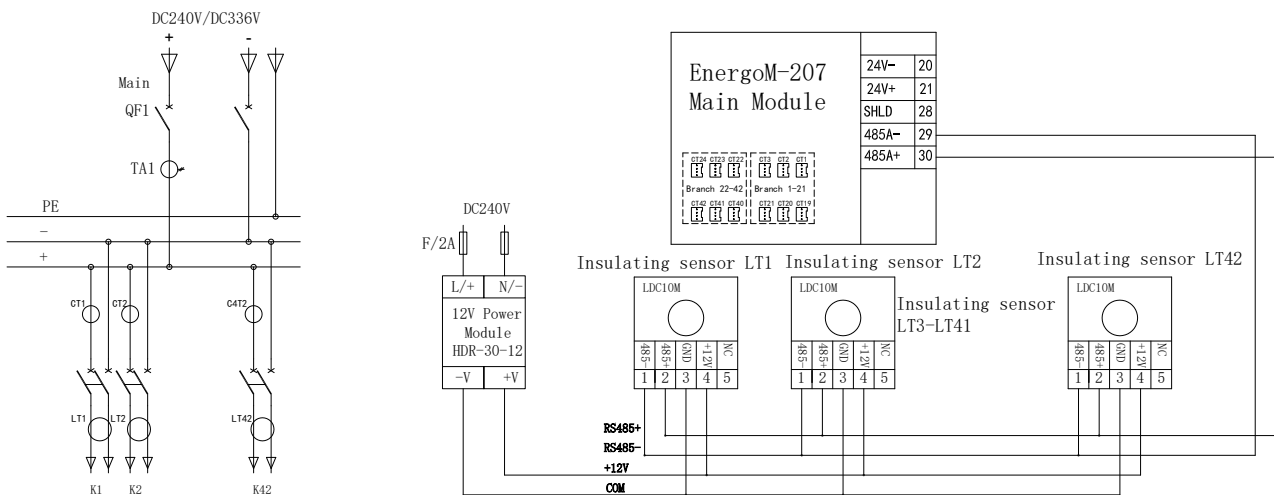
Pic 4.4

Note:
1. One EnergoM-207 main module can connect 42pcs of insulating sensors.
2. The insulating hall sensor need DC 12V power supply. The RS485 on sensor connect to the main module's RS485A.

4.8 DC240V (or DC336V) system wiring
4.8.1 DC240V main income circuit wiring

Pic 4.5

Note:
1. One SPM207 main module can measure 42 branch circuits. If there are more than 42 circuits, users need to add main module. Max. monitor 84 branch circuits.
2. One SPM207 main module has 4DI (dry contact) for monitoring the main circuit breaker status, Surge protection switch status and SPD faulty.
3. SPM207 main module terminal No. 22, 23, 24 is the RS485 port for connecting 3rd party monitoring system.
4. SPM207 main module gets power supply from the upper end of main circuit switch.
5. NC is Null.

4.8.2 DC 240V branch circuit wiring

Branch Circuits Wiring

Main

DC 240V

PE

+
−

QF1

TA1

+
M
G
−
+
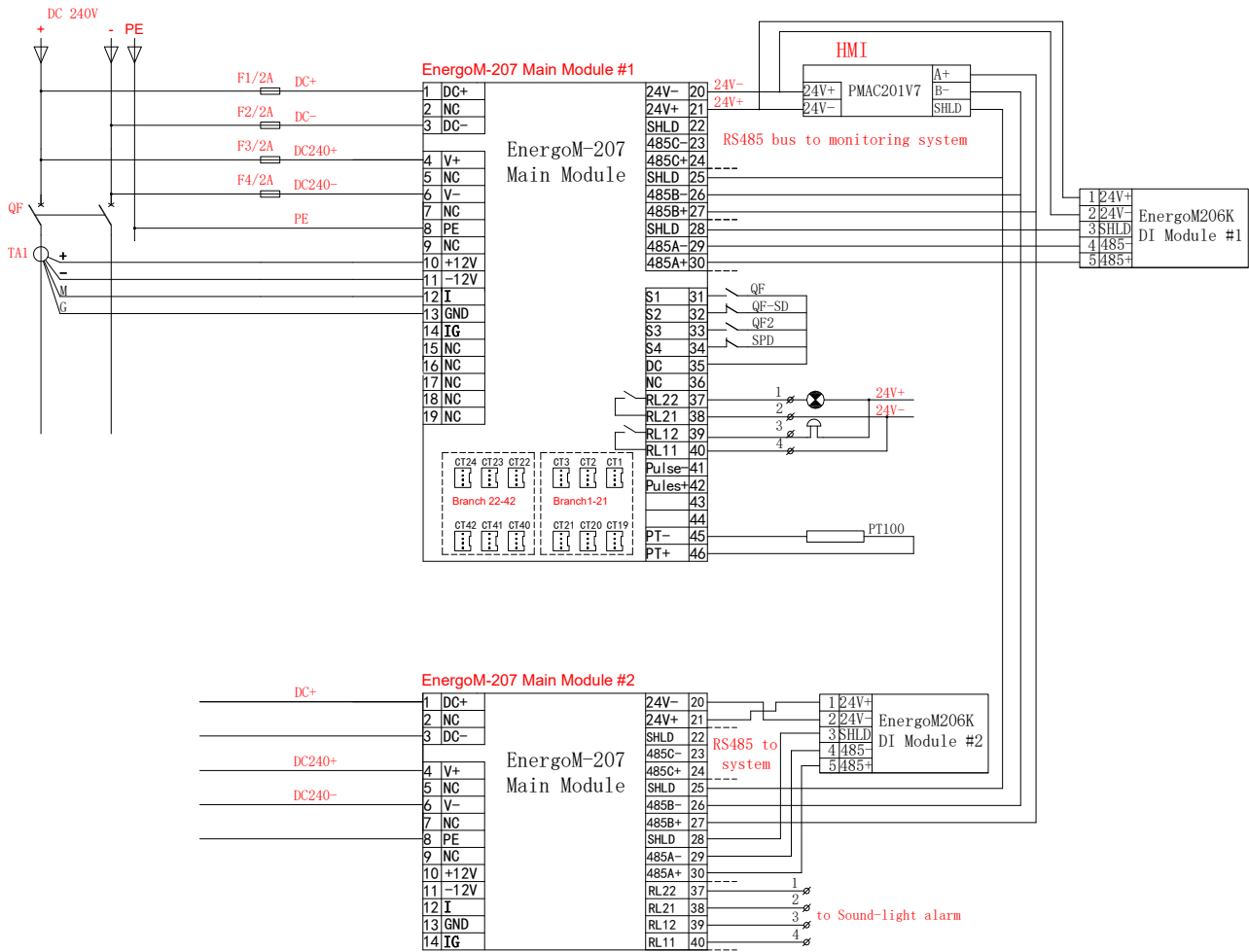
SPM207
Main Module

Branch 22-42
Branch1-21

K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14 K15

K40 K41 K42

24V−	20
24V+	21
SHLD	28
485A−	29
485A+	30

Note:
1. One SPM207 main module can connect 42pcs of branch circuit hall sensor. The hall sensor has 4 terminals (+), (−), (M), (G). It has a cable to connect with main module. (Cable model No.: KF2510/4P),
2. One SPM206K can monitor 42 channels of DI. The DI type is wet contact, get power supply from branch switch.
3. The DI module PilotSPM206K terminal SG1 and SG2, between SG1 and SG2 is not conducted.

SPM206K
(DC 240V)
DI Module

1	24V+	
2	24V−	
3	SHLD	
4	485−	
5	485+	
6	S1	K1
7	S2	K2
8	S3	K3
9	S4	K4
10	S5	K5
11	S6	K6
12	S7	K7
13	S8	K8
14	S9	K9
15	S10	K10
16	S11	K11
17	S12	K12
18	S13	K13
19	S14	K14
20	S15	K15
21	S16	K16
22	S17	K17
23	S18	K18
24	S19	K19
25	S20	K20
26	S21	K21
27	SG1	
28	S22	K22
29	S23	K23
30	S24	K24
31	S25	K25
32	S26	K26
33	S27	K27
34	S28	K28
35	S29	K29
36	S30	K30
37	S31	K31
38	S32	K32
39	S33	K33
40	S34	K34
41	S35	K35
42	S36	K36
43	S37	K37
44	S38	K38
45	S39	K39
46	S40	K40
47	S41	K41
48	S42	K42
49	SG2	−

Pic 4.6

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4.8.3 DC240V single main income wiring

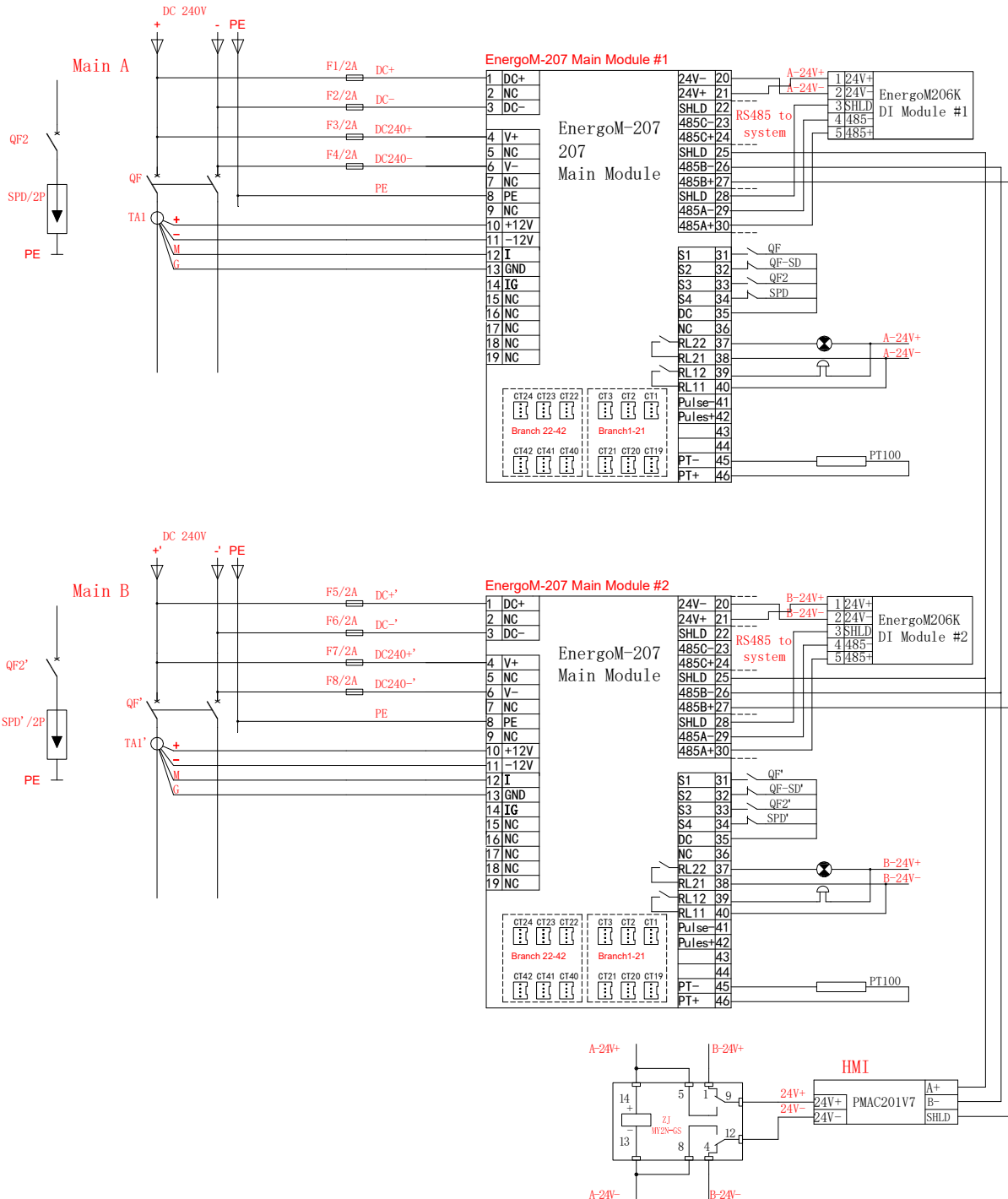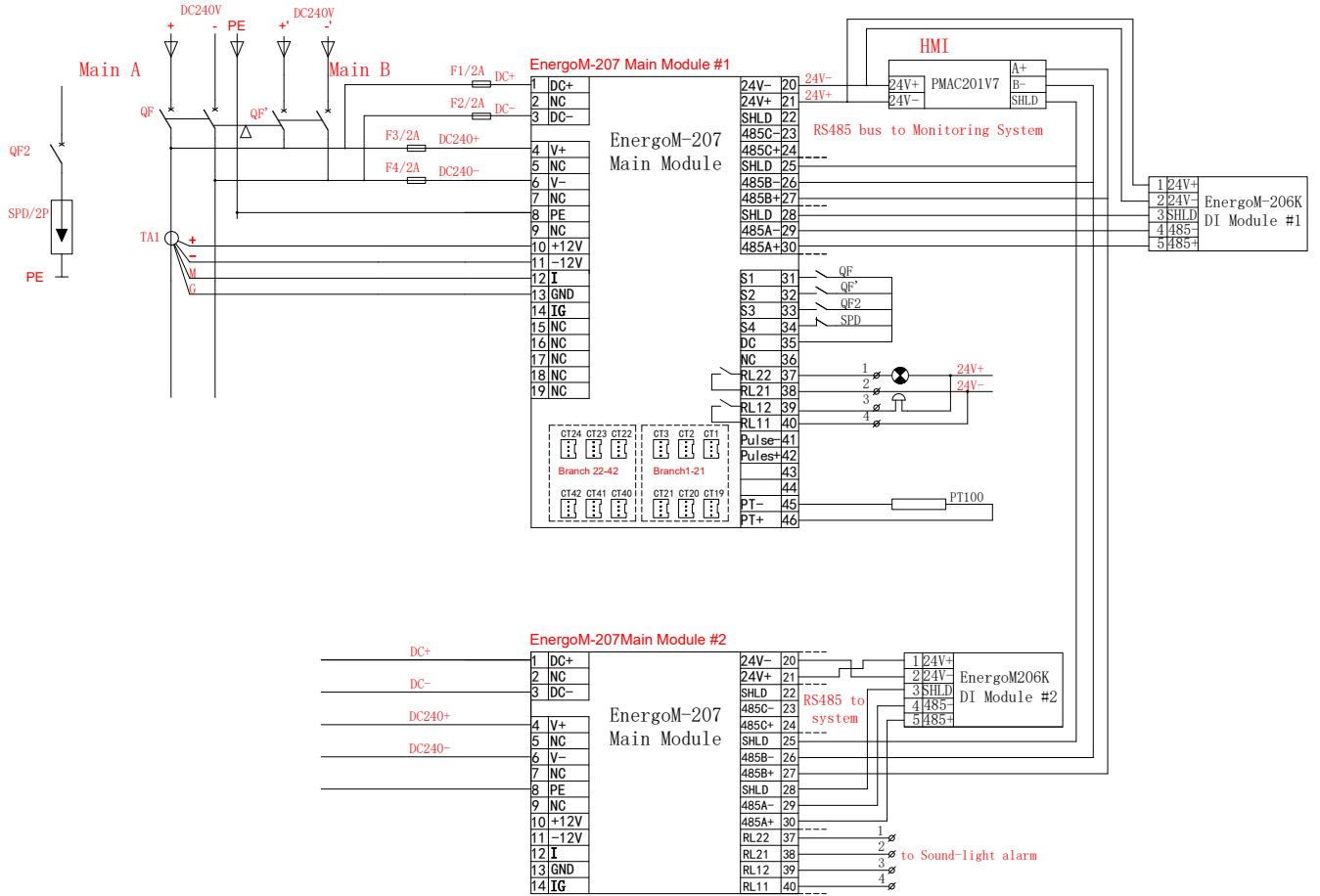## Wiring for One Main Incoming Circuit System

Pic 4.7

Configuration table for different branch circuit Num.:   ■ Require   □ No require

Branch circuit Num.	EnergoM-207 Main module	EnergoM-207 Main module	Remark
21 or 42	■	□	
63 or 84	■	■	

4.8.4 DC240V two main income wiring

Wiring for Two Main Incoming Circuits System


Pic 4.8

Configuration table for different branch circuit Num.:　■ Require　□ No require

Branch circuit Num.	EnergoM-207 Main module	EnergoM-207 Main module	Remark
21or 42	■1	■2	

4.8.5 DC240V one main one spare income wiring

Wiring for One Main + One Backup System

Pic 4.9

Configuration table for different branch circuit Num.: ■ Require □ No require

Branch circuit Num.	EnergoM-207 Main module 1	EnergoM-207 Main module 2	Remark
21or 42	■	□	
6 or 84	■	■	

4.9 DC-48V system wiring
4.9.1 DC-48V main income circuit wiring

Main Circuit Wiring

SPM207 Main Module

RS485 bus to Monitoring System

HMI

PMAC201V7

SPM206K DI Module
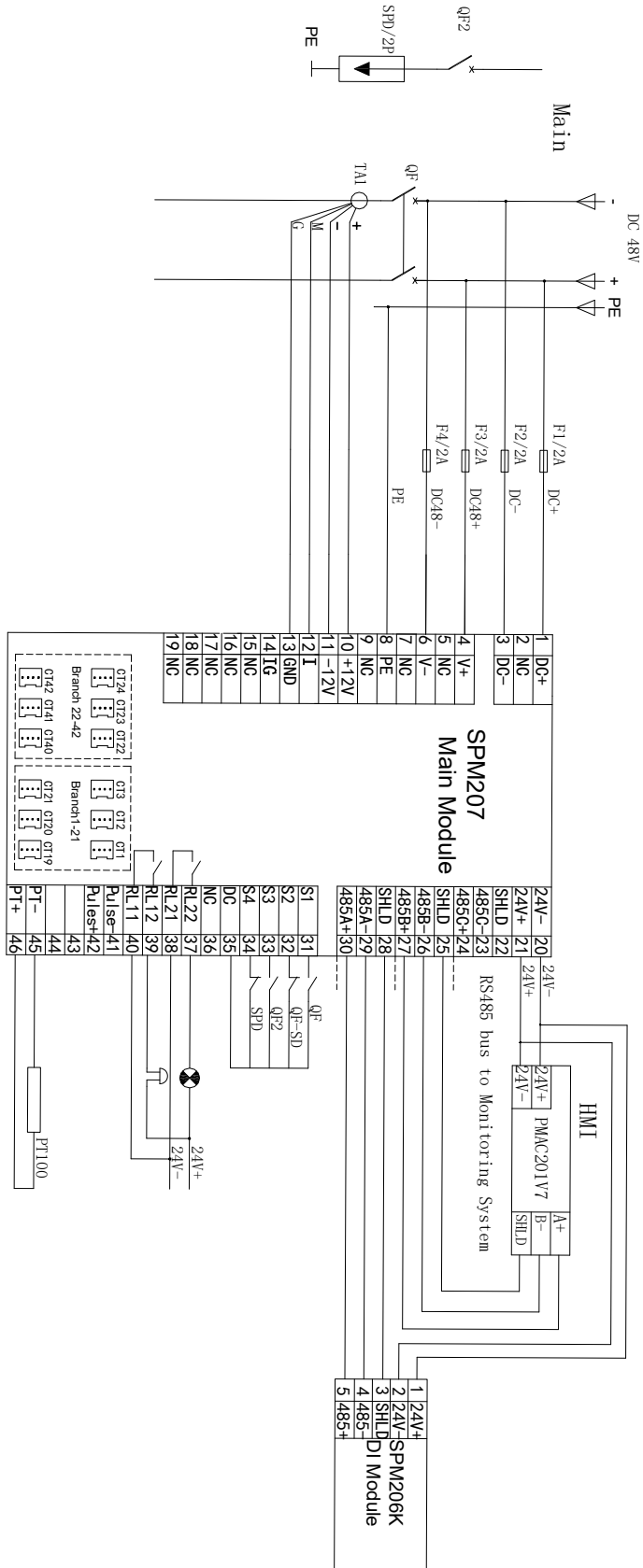
Note:
1. One PilotSPM207 main module can measure 42 branch circuits. If there are more than 42 circuits, users need to add main module. Max. monitor 84 branch circuits.
2. One PilotSPM207 main module has 4DI (dry contact) for monitoring the main circuit breaker status, Surge protection switch status and SPD faulty.
3. PilotSPM207 main module terminal No. 22, 23, 24 is the RS485 port for connecting 3rd party monitoring system.
4. PilotSPM207 main module gets power supply from the upper end of main circuit switch.
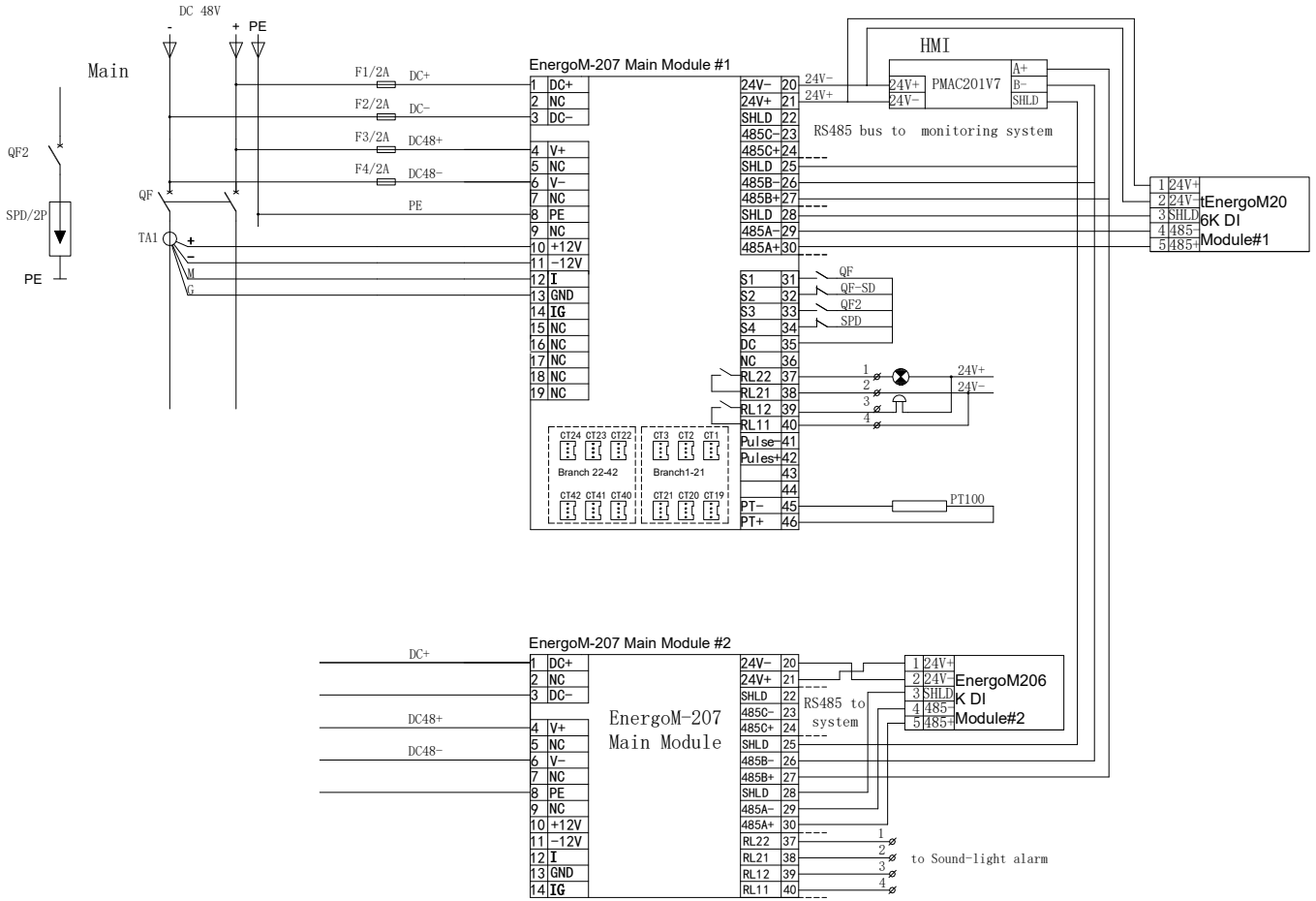5. NC is Null.

Pic 4.10

4.9.2 DC-48V branch circuit wiring
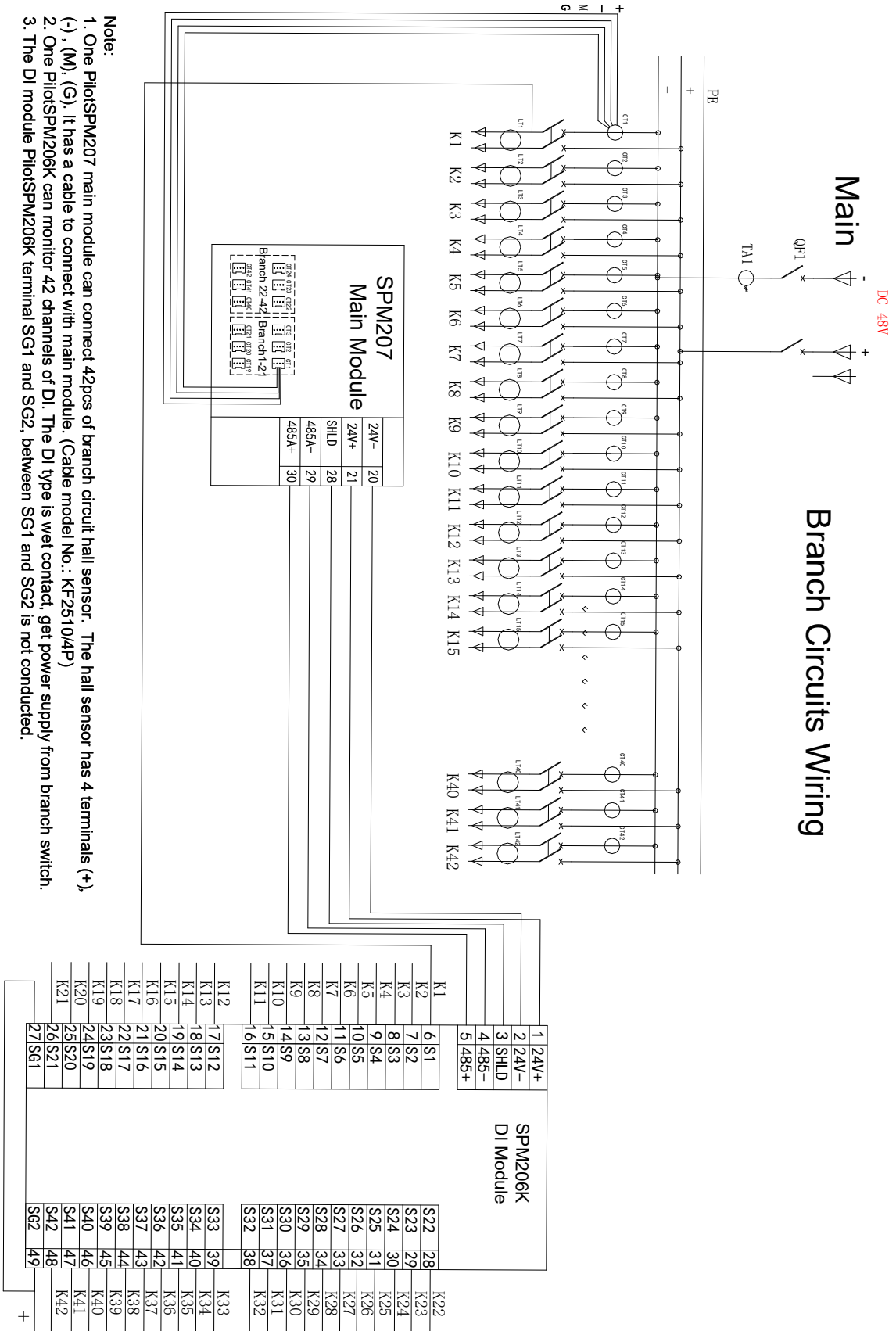
Pic 4.11

4.9.3 DC-48V single main income wiring
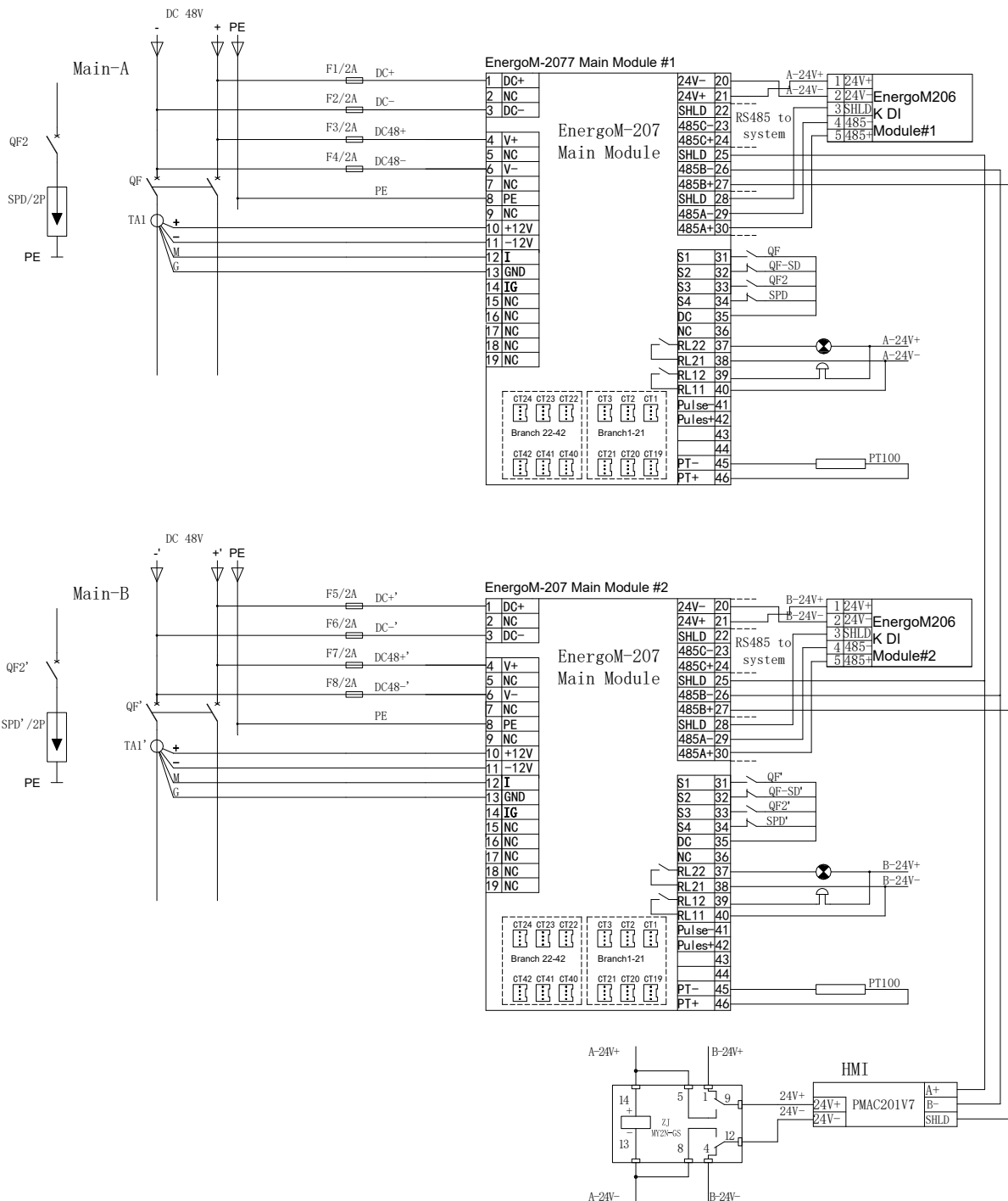
Wiring for One Main Incoming Circuit System

Pic 4.12

Configuration table for different branch circuit Num.: ■ Require □ No require

Branch circuit Num.	Energo M-207 module 1	EnergoM-207 Main module 2	Remark
21 or 42	■	□	
63 or 84	■	■	

4.9.4 DC-48V two main income wiring

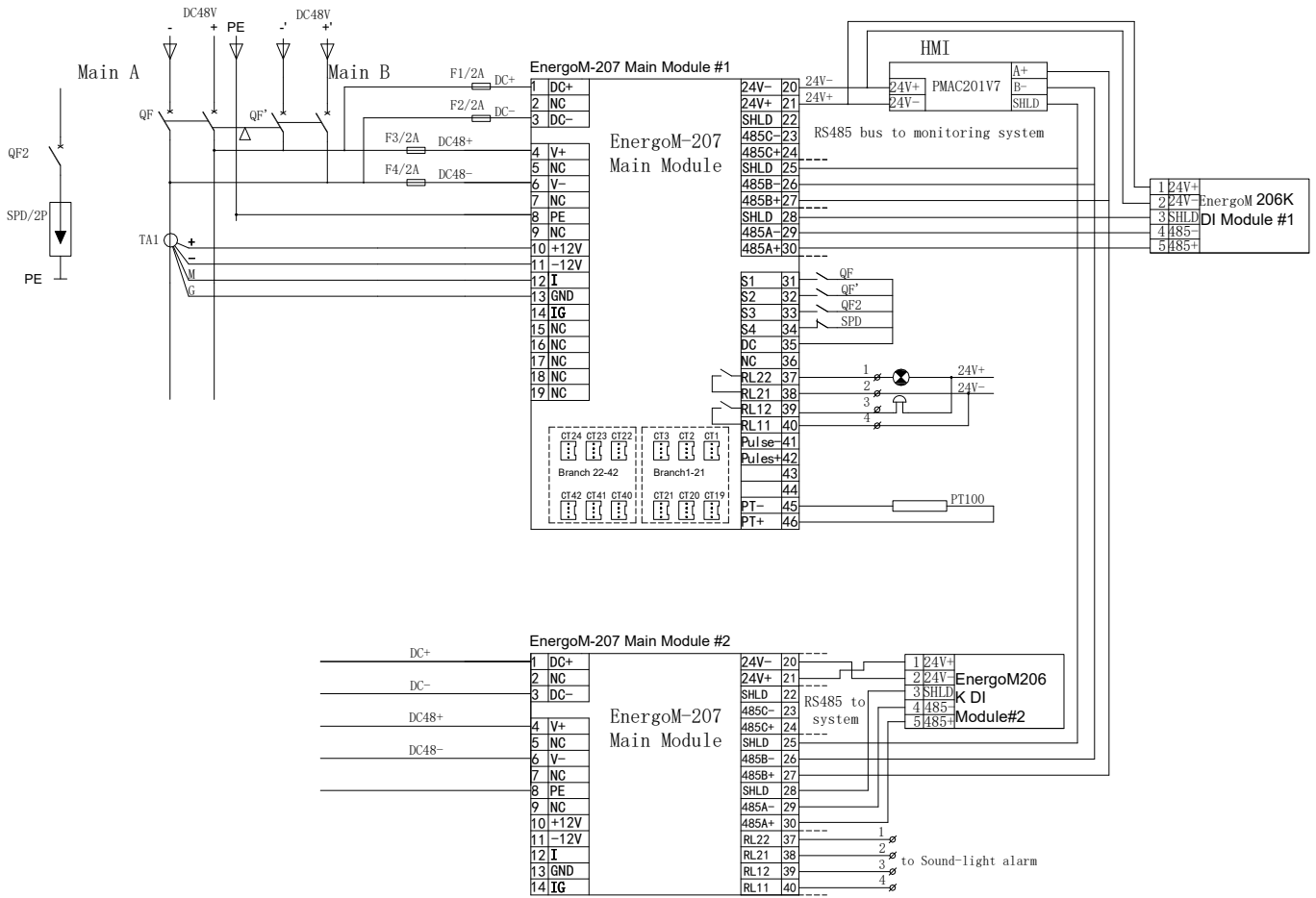### Wiring for Two Main Incoming Circuits System

Pic4.13

Configuration table for different outgoing circuit Num.: ■ Require □ No require

Branch circuit Num.	EnergoM-207 Main module	EnergoM-207 Main module	Remark
21 or 42	1	2	

4.9.5 DC-48V one main one spare income wiring

Wiring for One Main + One Backup System

Pic 4.14

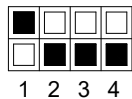**Configuration table for different outgoing circuit Num.:**   ■ Require   □ No require

Branch circuit Num.	EnergoM-207 Main module 1	EnergoM-207 Main module 2	Remark
21 or 42	■	□	
63 or 84	■	■	

4.10 DC336V system wiring

The wiring for DC336V system is same as DC240V system. It is only voltage change from DC240V to DC336V. Please refer to Chapter 4.8

4.11 Address setting for multiple main module

	Main module	Dial Switch Setting (■ is the switch position)
Single main input or One main one spare, 21 or 42 branch circuits	EnergoM-207 -Main module No.1	ON ■ □ □ □ □ ■ ■ ■ 1 2 3 4
Single main input or One main one spare, 63 or 84 branch circuits	EnergoM-207- Main module No.1	ON ■ □ □ □ □ ■ ■ ■ 1 2 3 4
	EnergoM-207- Main module No.2	ON □ ■ □ □ ■ □ ■ ■ 1 2 3 4
Two main input, 63 or 84 branch circuits	EnergoM-207- Main module No.1	ON ■ □ □ □ □ ■ ■ ■ 1 2 3 4
	EnergoM-207- Main module No.2	ON □ □ ■ □ ■ ■ □ ■ 1 2 3 4

5. Display and Operation

5.1 System Configuration

After Power On, HMI displays the real time data, under real time data interface, press "System Config" button to enter into system configuration interface

Notice
After Power ON, should finish main incoming line mode selection and Outgoing line circuits selection setting first, then to setting other parameters

5.1.1 One main income configuration

Set to One main income , as picture 5.1
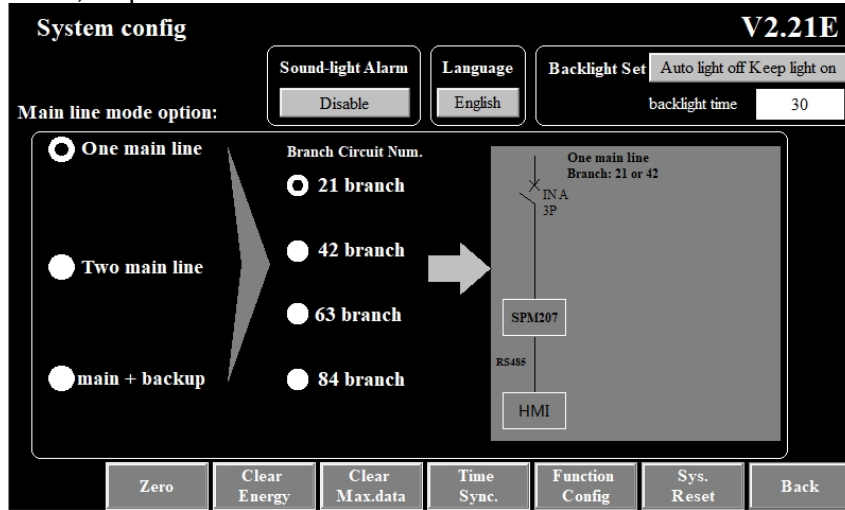
Pic. 5.1

5.1.2 Two main income configuration

Set to two main income , as picture 5.2
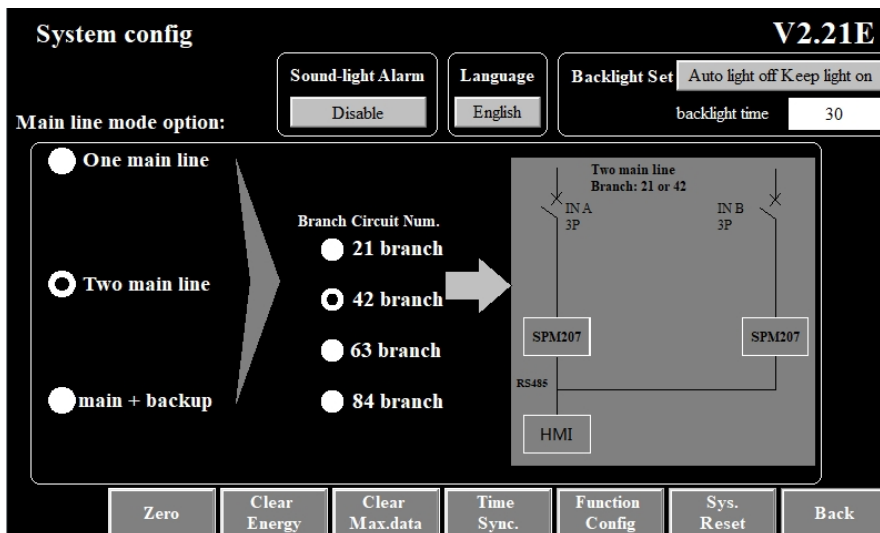
Pic. 5.2

5.1.3 One Main One Spare incoming configuration
Set to " main + back up", as picture 5.3
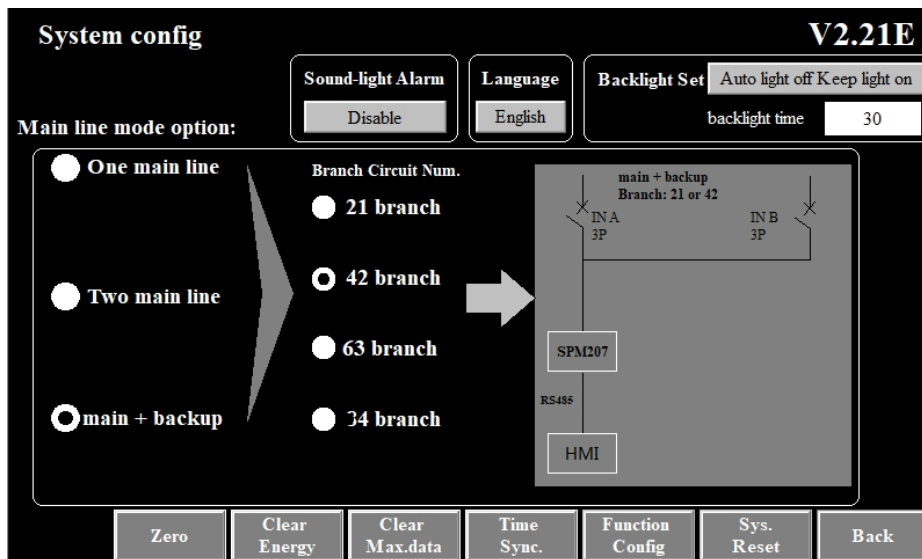
Pic. 5.3

5.1.4 Clear Energy data
Clear Main Module Energy data, as picture 5.4
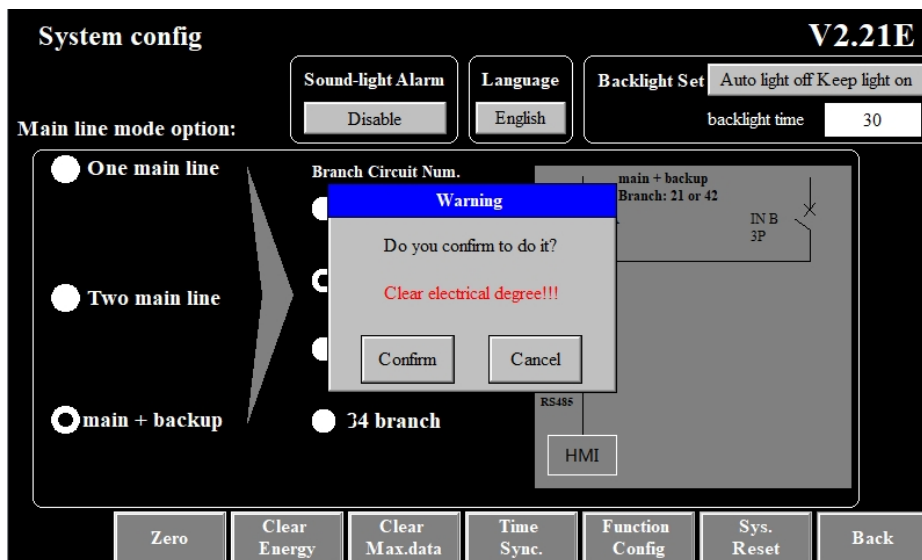
Pic. 5.4

5.1.5 Clear Maxim data

Clear max.data Clear all the Maxim value information in Main Module, e.g. Maxim Current value, Maxim Demand current etc

5.1.6 Time Synchronization

Time sync. Synchronization time on HMI and Main Module

5.1.7 Function Configuration
Function config Exchange to Information setting interface, as picture 5.5

Pic. 5.5

5.1.8 Setting

Set Press SET, after input correct password for further operation, default password: 201

5.1.9 Hall sensor calibration

In case, when the breaker is OFF, the current data is not "0", users can do calibration for the hall sensor. When doing calibration, please make sure the power supply for hall sensor is connected, and the breaker position is OFF (no load).

Operation as below:

Click ▮▮▮▮▮▮, input the password, after input correct password can do calibration

Precautions:

1) Before calibration, make sure that the outgoing circuit is not connected to the load.
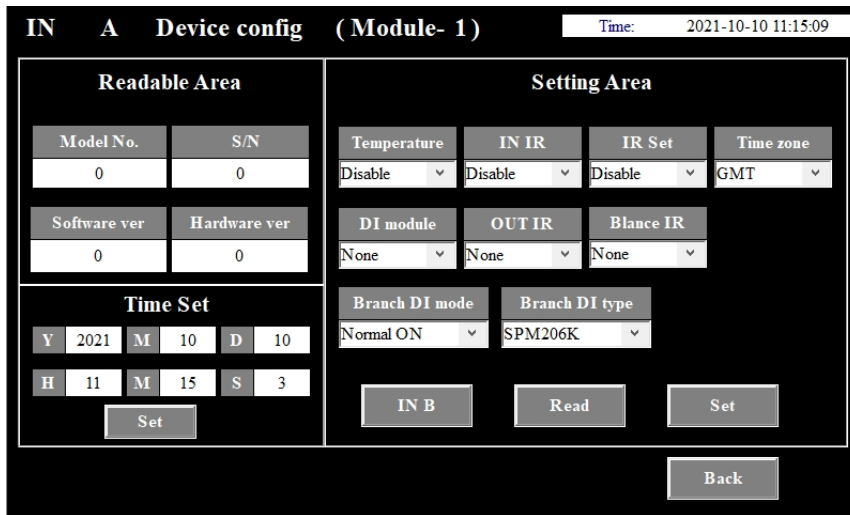
2) Before calibration, make sure there is no leakage at the site.

3) Default password 201. After calibration, check the outgoing insulation resistance value. If the value is 10K, the calibration success, if not 10K, calibration fails.
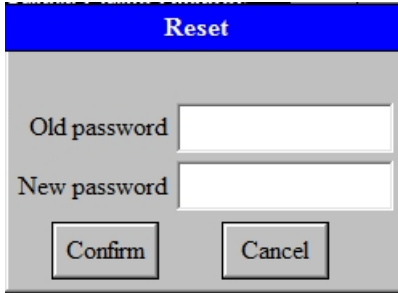
5.1.10 Password Input

when Clear Maxim value, Time Synchronization, Function Configuration, Set system configuration, it require to input the password for further operation. Default password: 201
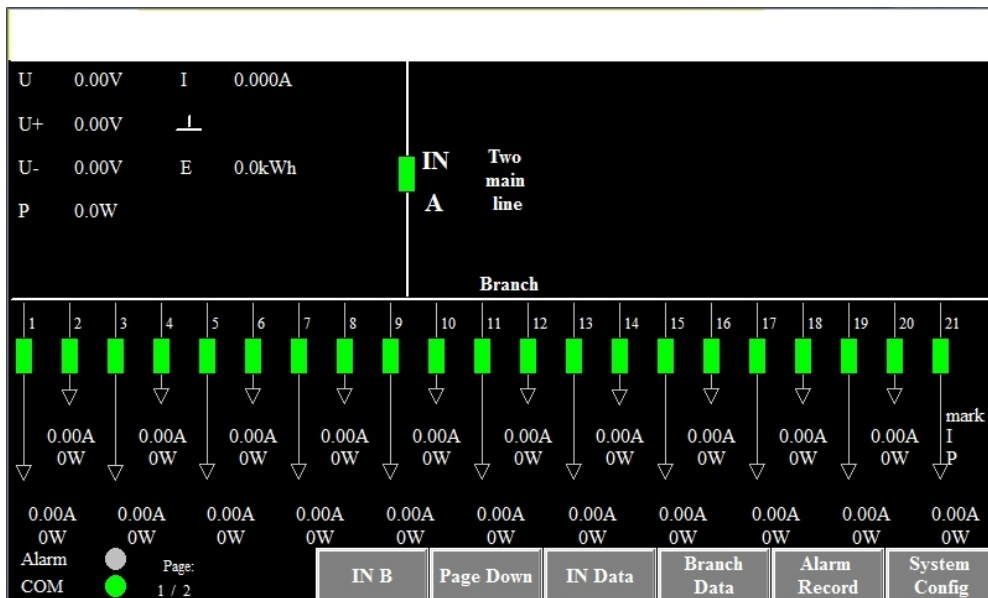
5.1.11 Password Modification

Reset

Old password   [   ]

New password [   ]

[Confirm]   [Cancel]

5.2 Data Display

5.2.1 Real Time Data Display

Power on the HMI, user can enter into home page of display as below picture 5.6, Display real-time data of one or two main incoming circuit and 21 branch outgoing circuit as well as the condition of switch status.

U	0.00V	I	0.000A
U+	0.00V	⊥	
U-	0.00V	E	0.0kWh
P	0.0W		

IN A   Two main line

Branch

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W

mark I P

0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W   0.00A 0W

Alarm ⚪   Page: 1 / 2   COM 🟢

[IN B] [Page Down] [IN Data] [Branch Data] [Alarm Record] [System Config]

Pic. 5.6

5.2.2 Switch status display

Main Switch：   🟩   Is the condition of main circuit DI status, green means DI 1 is "OFF", red means DI 1 is "ON", Flash means " Error"

Branch Switch：   🟩   Is the condition of branch circuit DI status, green means DI is "OFF", red means DI is "ON", Flash means " Error"

5.2.3 Alarm display

Alarm ⚪   The alarm light will turn red and flash when event happen. Gray means no alarm.

5.2.4 Communication Status Indicate

COM ⚪   Green means the communication between HMI and main module is normal. Gray means no communication.

5.2.5 Ground voltage and ground polarity

"U+" is the positive-to-ground voltage, and the normal value is about 50%U, which becomes lower when grounding.
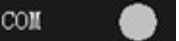
"U-" is the negative-to-ground voltage, and the normal value is about 50%U, which becomes lower when grounding.

'⊥' is the grounding polarity, and the display is '+' indicating that the positive pole is grounded, and the display is '-' indicating that the negative pole is grounded.

DC 240V system, usually if the insulation resistance is less than 24KΩ will be considered to be too low, the system may have leakage.

5.2.6 Key Instruction

Next: Enter to next System Interface
IN Data: Enter to main circuit data display interface
Branch Data: Enter to branch circuit data display interface
Alarm Record: Enter to Real-time alarm record interface
System Config: Enter to system configuration interface

5.3 Main Income Circuit Data Display

Display 1 loop incoming circuit real time data, as picture 5.7

Item	IN	Other	Unit
V	0		V
I	0		A
Load current	0.00		%
Max. I	0		A
Dmd_I	0		A
Max. dmd _I	0		A
P	0		W
Dmd_P	0		W
Max. dmd _P	0		W
Total kWh	0		kWh
Temperature			°C
IR			KΩ

IN A Real-time data

[IN B] [IN Set] [Back]

Pic. 5.7

5.4 Branch Circuit Data Display

Display multi loop branch circuit real time data, as picture 5.8

Branch 1 to 6 real-time data Module 1 Relay-1: OFF Relay-2: OFF

Item/Branch	1	2	3	4	5	6	Unit
mark							
I	0	0	0	0	0	0	A
Max. I	0	0	0	0	0	0	A
Dmd_I	0	0	0	0	0	0	A
Max. dmd _I	0	0	0	0	0	0	A
P	0	0	0	0	0	0	W
Dmd_P	0	0	0	0	0	0	W
Max. dmd _P	0	0	0	0	0	0	W
Total kWh	0	0	0	0	0	0	kWh
Load current	0.00	0.00	0.00	0.00	0.00	0.00	%

| Set DI | IR | Energy Record | Set Hall | Set Branch | Page Up | Page Down | Back |

Pic. 5.8

Keys instruction:
Set DI: Enter to branch circuit DI alarm configuration
Energy Record: Enter to history energy data record interface
Set Hall: Enter to setting hall sensor rated current
Set Branch: Enter to branch circuit alarm configuration
Page Up: View pervious page data
Page Down: View next page data
Back: Back to previous menu

If the devices come with Insulation monitor, it will show the insulation resistance value, as below Picture 5.9

Branch 1 to 21 IR

Branch 1 to 7

Branch	1	2	3	4	5	6	7	Unit
Positive Electrode	0	0	0	0	0	0	0	KΩ
Negative Electrode	0	0	0	0	0	0	0	KΩ

Branch 8 to 14

Branch	8	9	10	11	12	13	14	Unit
Positive Electrode	0	0	0	0	0	0	0	KΩ
Negative Electrode	0	0	0	0	0	0	0	KΩ

Branch 15 to 21

Branch	15	16	17	18	19	20	21	Unit
Positive Electrode	0	0	0	0	0	0	0	KΩ
Negative Electrode	0	0	0	0	0	0	0	KΩ

| Page Down | Alarm Settings | Back |

Pic. 5.9

5.5 Real-time Alarm Record Display

Display Maxim 15 pieces alarm information, as picture 5.10

Real-time alarm		
Date	Time	Alarm description
2021/10/10	11:21:57	Main line-A, main module and HMI communication or power outage

| Historical record | Page Up | Page Down | Back |

Pic. 5.10

History Information Record:

Historical record		
Date	Time	Alarm description
2021/10/10	11:24:09	PowerOn Record

| Page Up | Page Down | Back |

Pic. 5.11

5.6 Main Circuit Parameters Programming

Configure main income circuit parameters and alarm value, as picture 5.12

IN A Set (Module- 1)					
COM add:	Hall CT Num	IR Num	Baud rate:	Parity:	SD breakdown Alarm
0	0	0	1200	None	Disable
Main breaker Alarm	Branch breaker Alarm	S2 alarm mode	S4 alarm mode		
Disable	Disable	ON TO OFF	ON TO OFF		
Relay-1	Relay-2	S1 function	S2 function	S3 function	S4 function
Universal	Universal	Universal	Universal	Universal	Universal

CT Primary	5	Current lo-lo-limit:(A)	0	Temp. hi-limit:(℃)	0
Voltage lo-limit:(V)	0	Current lo-limit:(A)	0	Tem alarm return (℃)	0
Voltage hi-limit:(V)	0	Current hi-hi-limit:(A)	0	V-positive alarm（V）	0
IR lo-limit(KΩ)	0	Current hi-limit:(A)	0	V-negative alarm（V）	0

Set   Read   Back

Pic. 5.12

Items	Setting range and Instruction	Remark
COM add	1~247	Default setting: 1
Hall CT Num.	Branch hall sensor Num.: 0~42,	Default setting: 42
IR Num.	Insulation sensor Num.: 0~42,	Default setting: 0
Rated current (CT primary)	5~2000 The setting value must be a multiple of 5.	Default setting: 5.
Baud Rate	1200, 2400, 4800, 9600, 19200 or 38400	Default setting: 19200
Parity	None, Odd, Even	Default setting: None
SD breakdown Alarm	Disable: No alarm for branch circuit SD breakdown Enable: Alarm for branch circuit SD breakdown	
Main breaker Alarm	Disable: No alarm for main circuit breaker Enable: Alarm for main circuit breaker	
Branch breaker Alarm	Disable: No alarm for branch circuit breaker Enable: Alarm for branch circuit breaker	
S2 alarm mode	ON to OFF: Alarm when S2 changes from ON to OFF OFF to ON: Alarm when S2 changes from OFF to ON	
S4 alarm mode	ON to OFF: Alarm when S4 changes from ON to OFF OFF to ON: Alarm when S4 changes from OFF to ON	
Relay Function: Relay-1/ Relay-2	Universal: universal relay, user can control it by Modbus function code 05. RUN indication: relay active when the EnergoM-207 runs.	

	Alarm: relay active when there is alarm event for main or branch circuit. IN Alarm: relay active when there is alarm event for main circuit. OUT Alarm: relay active when there is alarm event for branch circuit. Tem Alarm: Relay active when the high temperature alarm. It will recover if the temperature back to normal.	
Main Circuit DI Function: S1, S2, S3, S4	Universal: Universal digital input IN Breaker: Main circuit breaker Spare: Spare part Surge protection: The surge protection switch SPD: Surge Protection Device	If the DI is set to be Surge protection switch, the HMI will show ON / OFF status. When HMI show ON, it means the Surge protection switch is ON. When HMI shows OFF, it means the Surge protection switch is OFF. If the DI is set to be SPD, the HMI will show the SPD symbol. When there is SPD alarm, the symbol will flash.
Current lo-lo-limit alarm	5.0~2500.0A, 0 means no alarm function Alarm trigger: when 0< current< setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current lo-limit alarm	5.0~2500.0A, 0 means no alarm function Alarm trigger: lo-lo limit value < current< setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current hi-limit alarm	5.0~2500.0A, 0 means no alarm function Alarm trigger: hi-hi-limit value > current> setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current hi-hi-limit alarm	5.0~2500.0A, 0 means no alarm function Alarm trigger: current > setpoint Alarm restore: 5s after alarm condition is eliminated.	
Voltage lo-limit alarm	20.0-500.0V, 0 means no alarm function. Alarm trigger: 0< voltage < setpoint Alarm restore: 5s after alarm condition is eliminated.	
Voltage hi-limit alarm	20.0-500.0V, 0 means no alarm function. Alarm trigger: voltage > setpoint Alarm restore: 5s after alarm condition is eliminated.	

Temperature hi-limit alarm	30.0—120.0 ℃ 0 means no alarm function. Alarm trigger: Temperature > setpoint Alarm restore: Temperature < setpoint, and 5s after alarm condition is eliminated.	
Temperature return	30.0—120.0 ℃ Return condition: Temperature < setpoint,	
Insulation resistance lo-limit alarm	15 --100KΩ, 0 means no alarm function. Alarm trigger: 0< IR < setpoint Alarm restore: 5s after alarm condition is eliminated.	
Positive bus voltage alarm	0~250, 0 means no alarm function. Alarm trigger: voltage > setpoint Alarm restore: 5s after alarm condition is eliminated.	
Negative bus voltage alarm v	0~250, 0 means no alarm function. Alarm trigger: voltage > setpoint Alarm restore: 5s after alarm condition is eliminated.	

5.7 Branch Circuit Parameter Programming

Outgoing circuit alarm setting as picture 5.14

Pic. 5.14

Items	Setting Range	Remark
Rated current	10~600A	
Current lo-lo-limit alarm	5.0~1000.0A, 0 means no alarm function. Alarm trigger: 0< current < setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current lo-limit alarm	5.0~1000.0A, 0 means no alarm function. Alarm trigger: lo-lo limit < current < setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current hi-limit alarm	5.0~1000.0A, 0 means no alarm function. Alarm trigger: hi-hi limit > current > setpoint Alarm restore: 5s after alarm condition is eliminated.	
Current hi-hi-limit alarm	5.0~1000.0A, 0 means no alarm function. Alarm trigger: current > setpoint Alarm restore: 5s after alarm condition is eliminated.	

If the devices come with Insulation monitor, users need to set do setting as below:
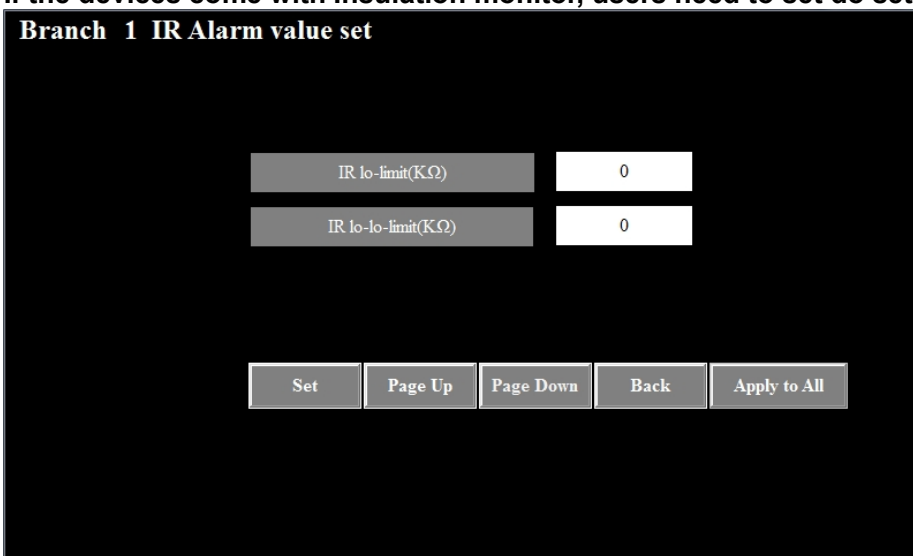
Pic. 5.15

Items	Setting Range	Remark
Insulation resistance lo-limit alarm	15~100KΩ, 0 means no alarm function. Alarm trigger: 0< IR < setpoint Alarm restore: 5s after alarm condition is eliminated.	
Insulation resistance lo-lo-limit alarm	15~100KΩ, 0 means no alarm function. Alarm trigger: 0< IR < setpoint Alarm restore: 5s after alarm condition is eliminated.	

If users want to set alarm for branch circuit DI, please enter to the sub-menu "Set DI" , as below picture.

5.8 History Energy Data

Display historical Year electrical degree value, as picture 5.16

XXXX Year 1 to 42 Yearly Kwh						IN	0.0	kWh
Branch	1	2	3	4	5	6	7	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	8	9	10	11	12	13	14	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	15	16	17	18	19	20	21	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	22	23	24	25	26	27	28	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	29	30	31	32	33	34	35	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	36	37	38	39	40	41	42	Unit
Energy data	0	0	0	0	0	0	0	kWh
Search last	1	Year	Refresh			Monthly energy	Back	

Pic. 5.16

Display historical Month electrical degree value, as picture 5.17

XXXX Year XX Monthly 1 to 42 Monthly Kwh						IN	0.0	kWh
Branch	1	2	3	4	5	6	7	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	8	9	10	11	12	13	14	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	15	16	17	18	19	20	21	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	22	23	24	25	26	27	28	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	29	30	31	32	33	34	35	Unit
Energy data	0	0	0	0	0	0	0	kWh
Branch	36	37	38	39	40	41	42	Unit
Energy data	0	0	0	0	0	0	0	kWh
Search last	1	Monthly	Refresh			Yearly energy	Back	

Pic. 5.17

5.9 Branch Circuit Hall Sensor Setting

Display hall sensor specification as picture 5.18

Pic 5.18

5.10 Branch Circuit Mark

Each branch circuit can be marked with 8 characters which shall be combined of letters and numbers, as picture 5.18

Pic.5.19

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