



**SmartGen**  
ideas for power

# HGM9530

## Genset Parallel (With Genset) Unit

### USER MANUAL



SMARTGEN (ZHENGZHOU) TECHNOLOGY CO.,LTD.

## 2 MODULES COMPARISON

Item		HGM9510	HGM9520	HGM9530	HGM9540
LCD	Dimension	4.3"			
	Pixel	480 x 272			
AMF			•		•
BUS Monitoring		•		•	
Parallel connection		•	•	•	•
Digital input expansion		•	•	•	•
Digital output expansion		•	•	•	•
Analog input expansion				•	•
Input Port		7	8	7	8
Output Port		8	8	8	8
Sensor Number		5	5	5	5
Neutral (Earth) current					
Schedule function		•	•	•	•
RS485		•	•	•	•
GSM					
J1939		•	•	•	•
USB		•	•	•	•
LINK					
Real-time clock		•	•	•	•
Event log		•	•	•	•

**▲ NOTE:**

(1) Two of the outputs are fixed: start output and fuel output.

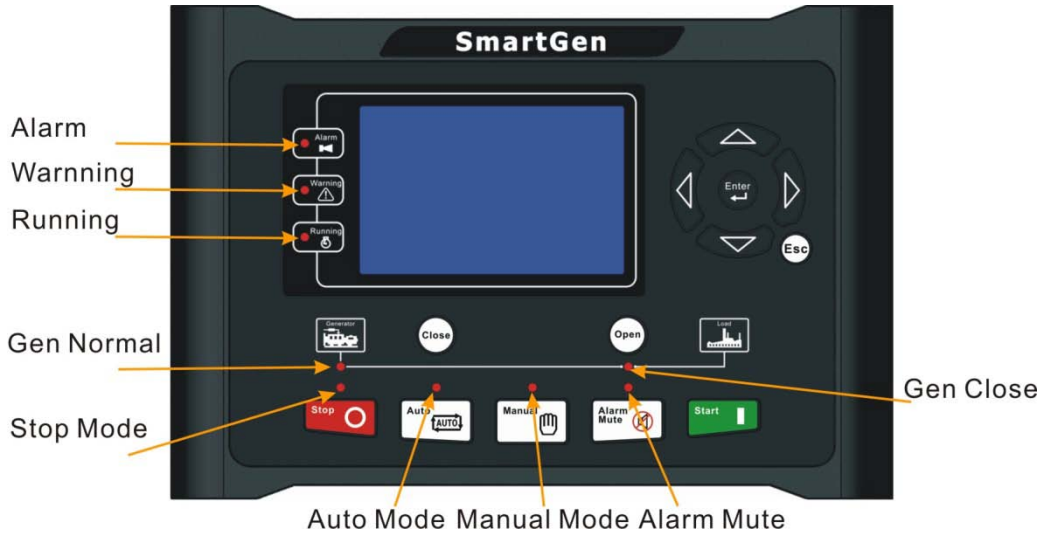
(2) HGM9530's analog sensors are composed by 3 fixed sensors (temperature, pressure, level) and 2 configurable sensors.

**▲ NOTE:** The features of HGM9210/HGM9220/HGM9310/HGM9320/HGM9410/

HGM9420/HGM9520/HGM9610/HGM9620 controllers mentioned in this document may change, please check the corresponding user manual for accurate information.

## 5 OPERATION

### 5.1 INDICATOR LIGHT



**NOTE:** Selected light indicators description:














Warning indicator and Alarm indicator:




Alarm Type	Warning Indicator	Alarm Indicator
Warning	Slow flashing	Slow flashing
Trip Alarm	Slow flashing	Slow flashing
Shutdown Alarm	Off	Fast flashing
Trip and Stop Alarm	Off	Fast flashing


Running indicator: illuminated from crank disconnect to ETS while off during other periods.

Generator normal light: It is light on when generator is normal; flashing when generator state is abnormal; off when there is no generator power.

## 5.2 PUSHBUTTONS





Icons	Keys	Description
	Stop	Stop running generator in Auto/Manual mode; Lamp test (press at least 3 seconds); Reset alarm in stop mode; During stopping process, press this button again to stop generator immediately.
	Start	Start genset in <b>Manual</b> mode.
	Manual Mode	Press this key and controller enters in <b>Manual</b> mode.
	Auto Mode	Press this key and controller enters in <b>Auto</b> mode.
	Mute/Reset Alarm	Alarming sound off; If trip alarm occurs, pressing the button at least 3 seconds can reset this alarm.
	Close	Close breaker in manual mode.
	Open	Open breaker in manual mode.
	Up/Increase	1) Screen scroll; 2) Up cursor and increase value in setting menu.
	Down/Decrease	1) Screen scroll; 2) Down cursor and decrease value in setting menu.
	Left	1) Screen scroll; 2) Left move cursor in setting menu.
	Right	1) Screen scroll; 2) Right move cursor in setting menu.
	Set/Confirm	Select viewing area.
	Exit	1)Return to main menu; 2) Return to previous menu in setting menu.

 **NOTE:** Press  and  simultaneously in manual mode will force generator to crank. Successful start will not be judged according to crank disconnect conditions, operator will have to crank the starter motor manually; when operator decides that the engine has fired, he/she should release the button and start output will be deactivated, safety on delay will be initiated.

 **WARNING:** Default password is 00318, user can change it in case of others change the advanced parameters setting. Please clearly remember the password after changing. If you forget it, please contact SmartGen services and send all information in the controller page of “**ABOUT**” to us.

### 5.3 LCD DISPLAY

#### 5.3.1 MAIN DISPLAY

Main screen show pages; use   to scroll the pages and   to scroll the screen.

- **Main Screen**, including as below,

Gen: voltage, frequency, current, active power, reactive power

Bus: voltage, frequency

Engine: speed, temperature, oil pressure

Some status

- **Status**, including as below,

Status of genset and ATS

- **Engine**, including as below,

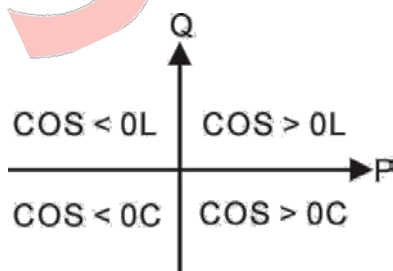
Engine speed, engine temperature, engine oil pressure, fuel level, flexible sensor 1, flexible sensor 2, battery voltage, charger voltage, engine accumulated run, accumulated start times.

**▲NOTE:** If connected with J1939 engine via CANBUS port, this page also includes: coolant pressure, coolant level, fuel temperature, fuel pressure, inlet temperature, exhaust temperature, turbo pressure, total fuel consumption and so on. (Different engine with different parameters)

- **Generator**, including as below,

Phase voltage, line voltage, frequency, phase sequence, current, Active Power(positive and negative), total active power (positive and negative), Reactive Power(positive and negative), total reactive power (positive and negative), Apparent Power, total apparent power, Power Factor(positive and negative), average power factor (positive and negative), accumulated energy (**kWh, kVarh, kVAh**), multi power, earth current, negative sequence current.

**▲NOTE:** Power factor shows as following,



Remark:

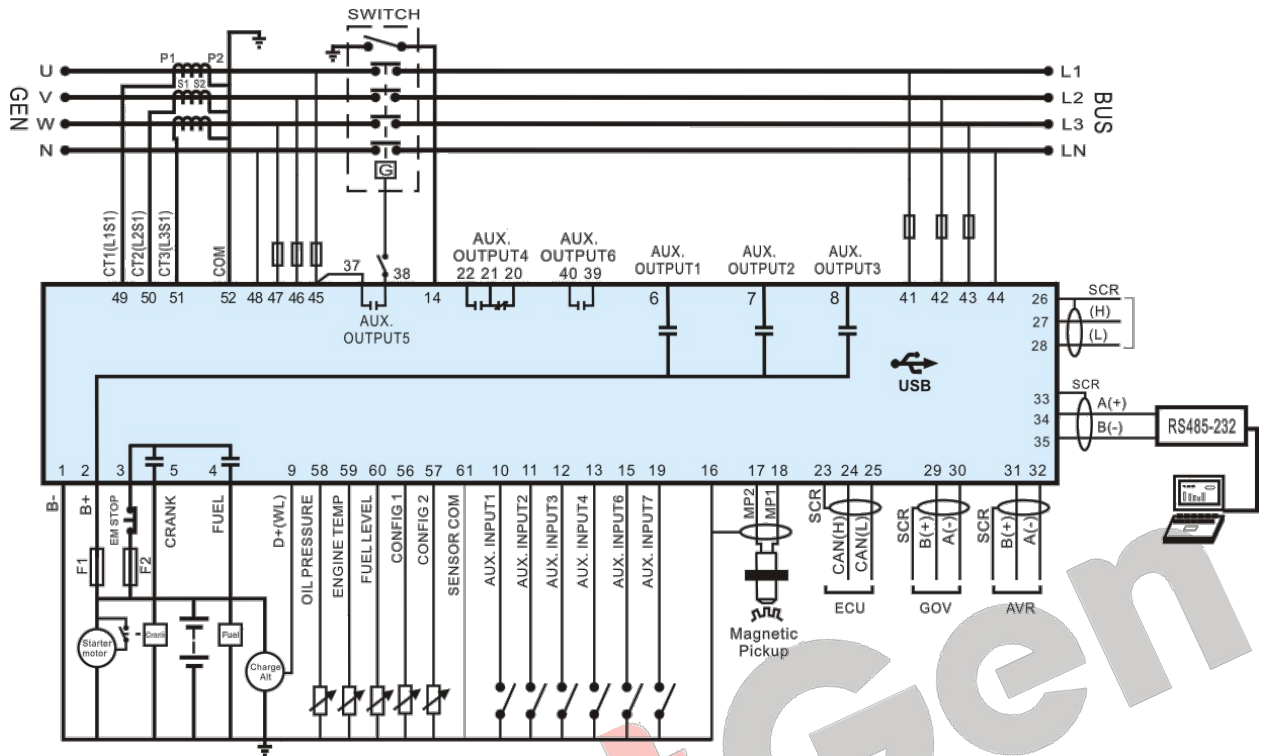
P stands for active power

Q stands for inactive power

Power factor	Conditions	Active power	Reactive power	Remark
COS>0L	P>0,Q>0	Input	Input	Load is inductive resistance.
COS>0C	P>0,Q<0	Input	Output	Load is capacitance resistance.
COS<0L	P<0,Q>0	Output	Input	Load is equal to one under excitation generator.
COS<0C	P<0,Q<0	Output	Output	Load is equal to one over excitation generator.

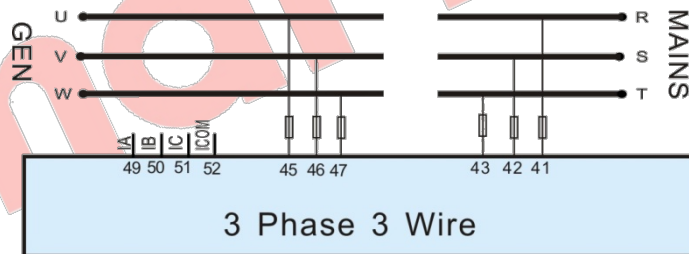
## 12 TYPICAL APPLICATION

HGM9530 typical application diagram

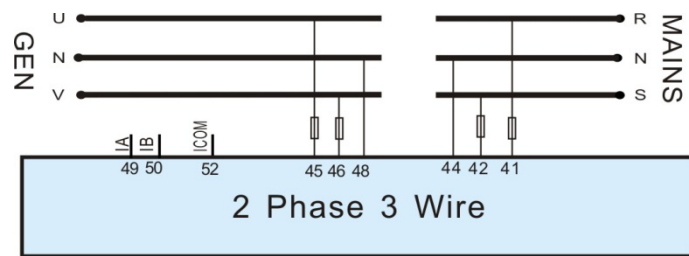


**Note:** Fuse F1: min. 2A; max. 20A. Fuse F2: max. 32A. Users should select suitable fuse depend on practical application.

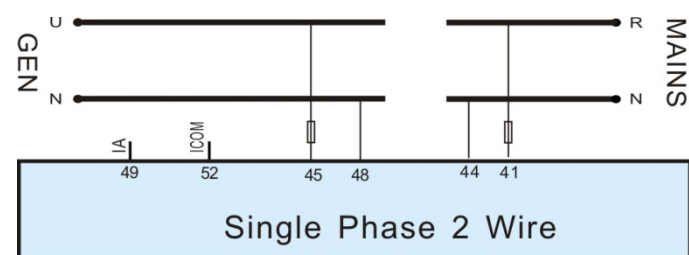
### 3 Phase 3 Wire



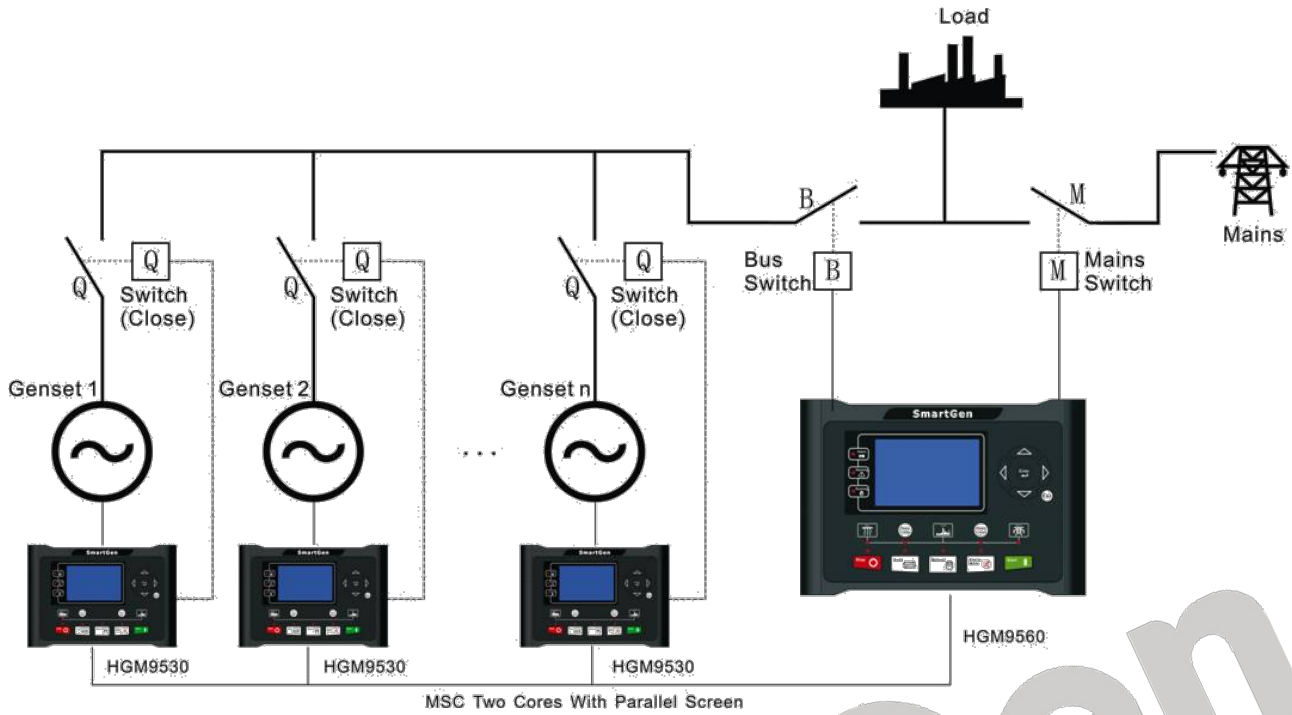
### 2 Phase 3 Wire



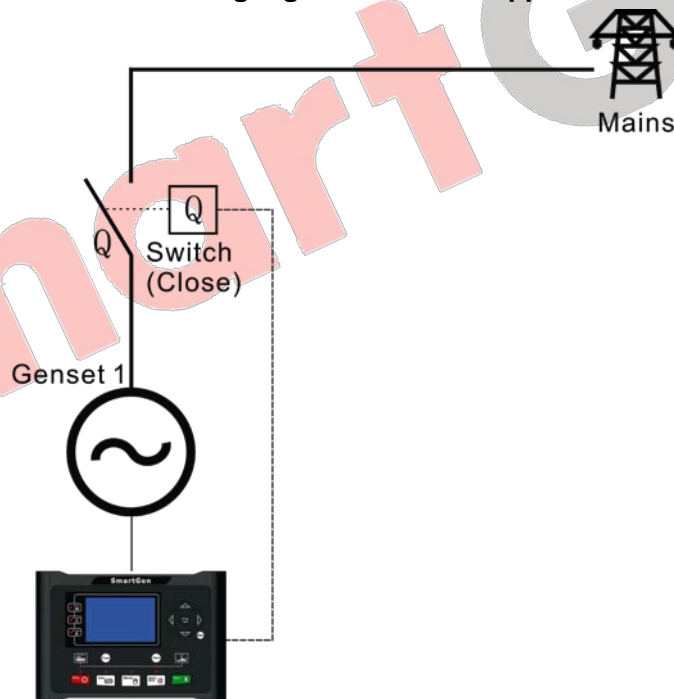
### Single Phase 2 Wire



### HGM9530 Multi-genset Parallel Application



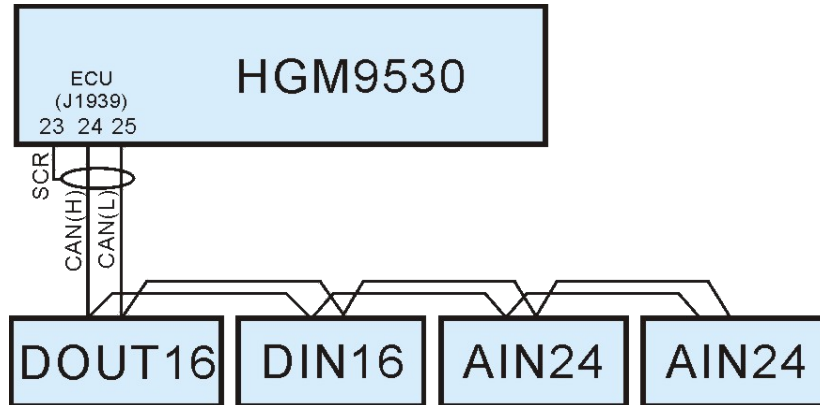
### HGM9530 Single-genset Parallel Application



**Note:** Mains parallel function for HGM9530 controller can be selected via configurable input port. In mains parallel mode, generator will run in parallel with mains and it will only be able to output a fixed amount of power. (Set load mode as Gen control mode).



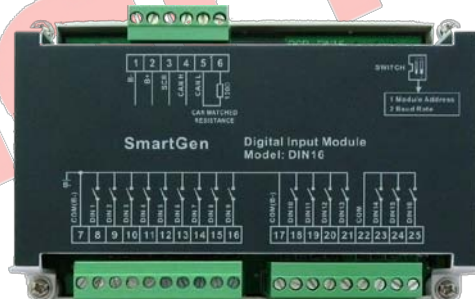
**HGM9530 Expansion Module Connection Diagram**



**Note:** HGM9530 can be connected with multiple expansion modules via ECU CANBUS port and it can expand 4 expansion modules most: 1 DOUT16 module, 1 DIN16 module, 2 AIN24 modules.



DOUT16 is digital output module concluding 16# auxiliary relay output.



DIN16 is digital input module concluding 16# auxiliary digital input.

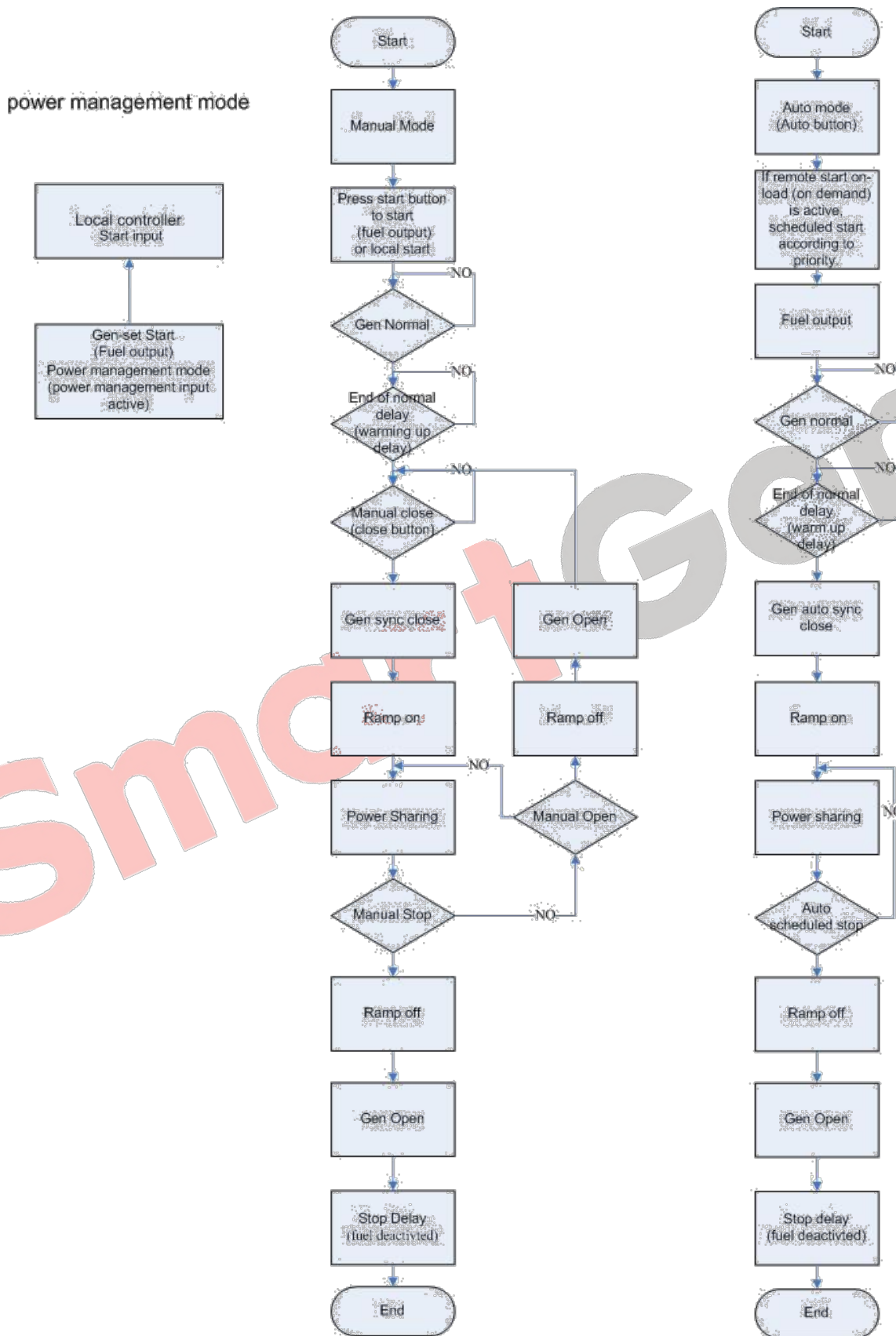


AIN24 is analog input module concluding 14# K-type thermocouple input, 5# PT100 resistance input and 5# 4-20mA current input.



### 13 POWER MANAGEMENT MODE

Power management mode can be selected via configurable input ports.



## 14 LOAD SHEDDING

Non-essential load ---- NEL for short.

The controller can control the NEL1, NEL2 and NEL3 to trip separately. The order of the essentiality is: NEL3 > NEL2 > NEL1

◆ Auto trip:

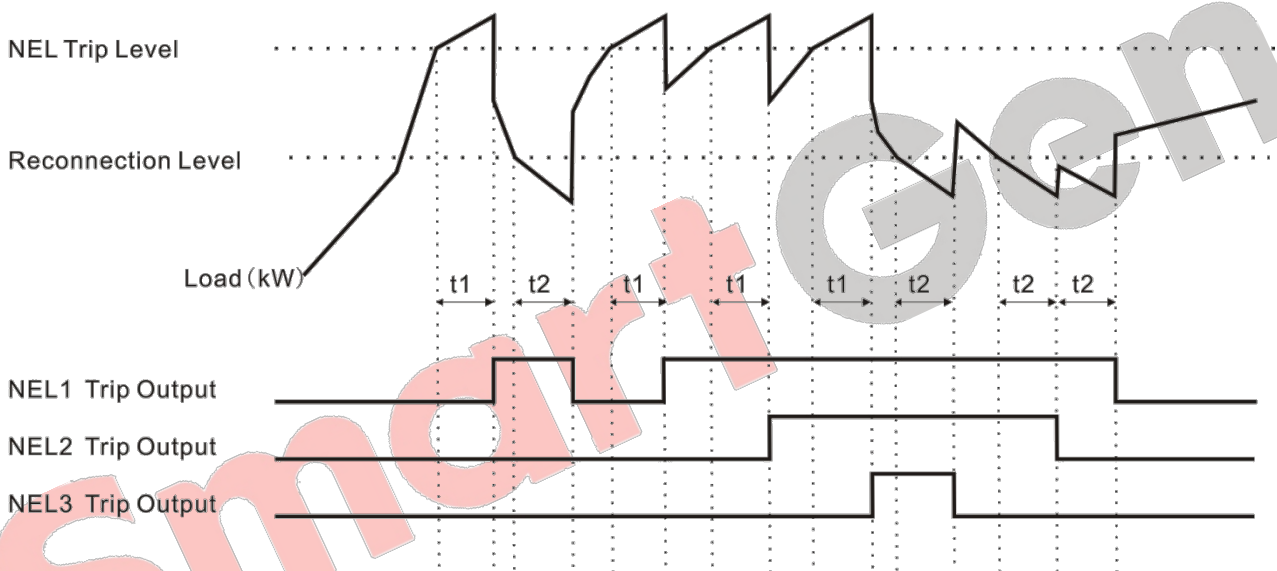
When NEL auto trip is enabled:

If the genset power has exceeded the NEL trip value, after the trip delay, NEL1 will trip the earliest, and then is NEL2, NEL3;

When NEL auto reconnection is enabled:

If the genset power has fallen below the auto reconnection set value, after the auto reconnection delay, NEL3 will reconnection the earliest, and then is NEL2, NEL1;

t1: NEL Trip Delay  
t2: Reconnection Delay



◆ Manual Trip

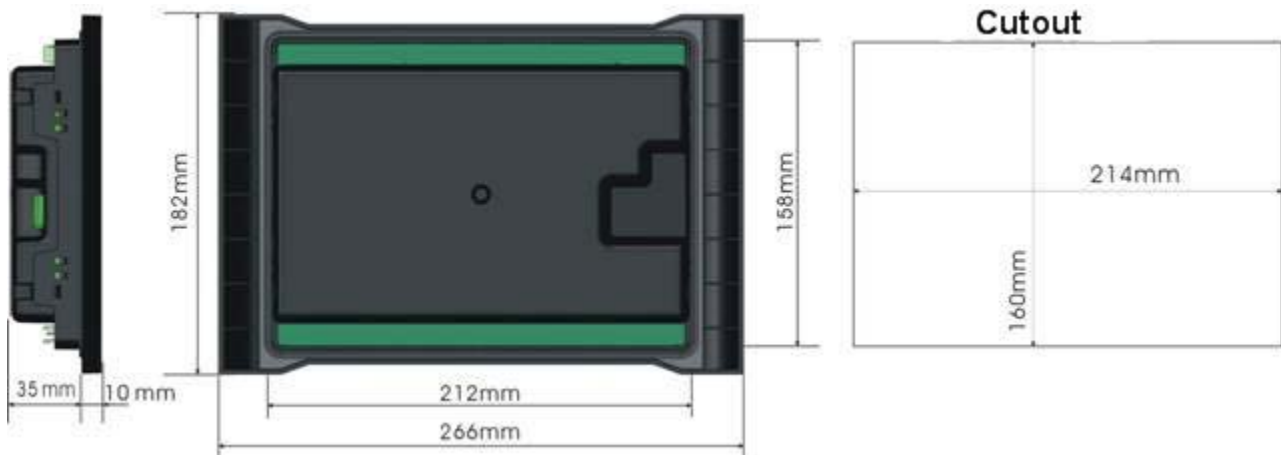
If NEL manual trip input is active (earthed failing edge is active), NEL1 will trip without delay; If NEL manual trip input is active again, NEL2 will trip; If NEL manual trip input is active the third time, NEL3 will trip. During this process, the controller do not detect if the genset power has exceeded the NEL trip value or not.

If NEL manual reconnection input is active (earthed failing edge is active), NEL3 will reconnect without delay; If NEL manual reconnection input is active again, NEL2 will reconnect; If NEL manual reconnection input is active the third time, NEL1 will reconnect. During this process, the controller detects the genset power: if the genset power has fallen below the NEL reconnection value, then the input is active; if it doesn't, the input is deactivated.

▲Note: When auto trip and auto reconnection are enabled, manual trip is still active.

## 15 INSTALLATION

Controller is panel built-in design; it is fixed by clips when installed. The controller's overall dimensions and cutout dimensions for panel, please refers to as following,



### 1) Battery Voltage Input

**▲NOTE:** HGM9530 controller can suit for widely range of battery voltage (8~35) VDC. Negative of battery must be connected with the shell of starter stable. The wire's diameter must be over  $2.5\text{mm}^2$  and which is connected to B+ and B- of controller power. If floating charge configured, please firstly connect output wires of charger to battery's positive and negative directly, then, connect wires from battery's positive and negative to controller's positive and negative input ports in order to prevent charge disturbing the controller's normal working.

### 2) Speed Sensor Input

**▲NOTE:** Speed sensor is the magnetic equipment which be installed in starter and for detecting teeth of flywheel. Its connection wires to controller should apply for 2 cores shielding line. The shielding layer should connect to No. 16 terminal in controller while another side is hanging in air. The else two signal wires are connected to No.17 and No.18 terminals in controller. The output voltage of speed sensor should be within AC(1~24)V (effective value) during the full speed. AC12V is recommended (in rated speed). When install the speed sensor, let the sensor is spun to contacting flywheel first, then, port out 1/3 lap, and lock the nuts of sensor at last.

### 3) Output And Expand Relays

**▲CAUTION:** All outputs of controller are relay contact output type. If need to expand the relays, please add freewheel diode to both ends of expand relay's coils (when coils of relay has DC current) or, increase resistance-capacitance return circuit (when coils of relay has AC current), in order to prevent disturbance to controller or others equipment.

### 4) AC Input

Current input of controller must be connected to outside current transformer. And the current transformer's secondary side current must be 5A. At the same time, the phases of current transformer and input voltage must correct. Otherwise, the current of collecting and active power maybe not correct.

**▲NOTE:** ICOM port must be connected to negative pole of battery.



**WARNING!** When there is load current, transformer's secondary side prohibit open circuit.

### 5) Withstand Voltage Test

**▲CAUTION!** When controller had been installed in control panel, if need the high voltage test, please disconnect controller's all terminal connections, in order to prevent high voltage into controller and damage it.