



SmartGen
ideas for power

CMM363-2G
CLOUD MONITORING COMMUNICATION MODULE
USER MANUAL

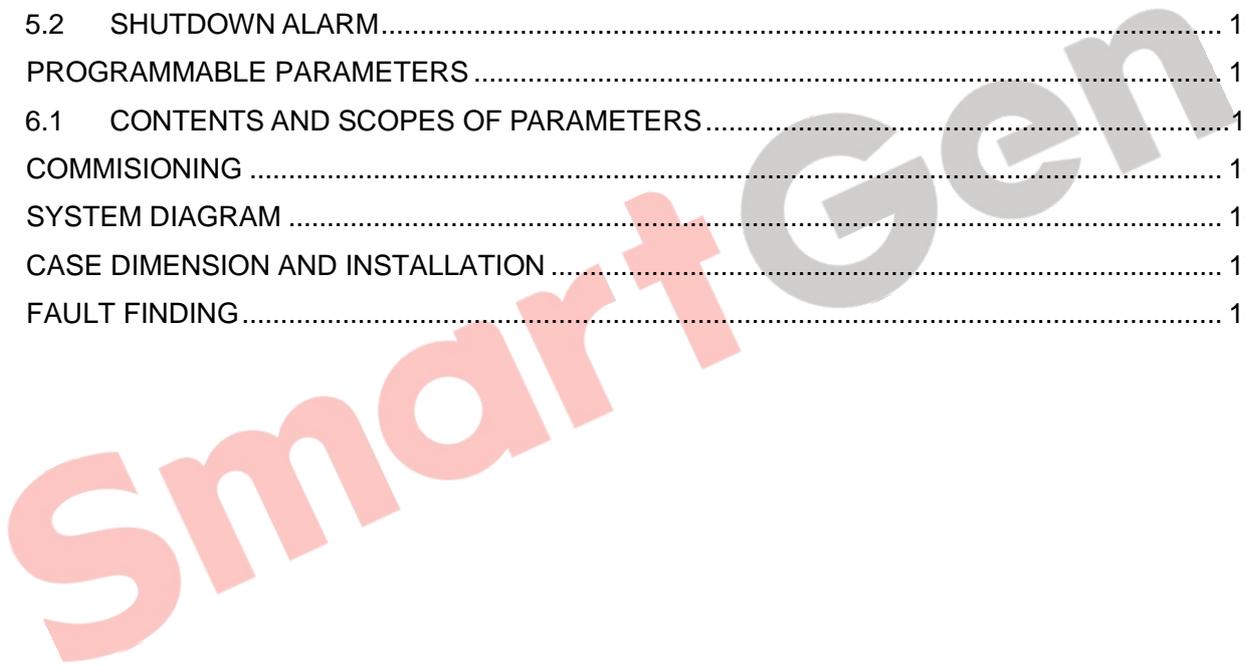


SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.



CONTENT

1	OVERVIEW	4
2	PERFORMANCE AND CHARACTERISTICS	4
3	SPECIFICATION	5
4	PANEL AND TERMINAL DESCRIPTION	6
4.1	PANEL INDICATION AND BUTTONS	6
4.2	GPRS	7
4.3	GPS	7
4.4	SIM INSTALLATION	7
4.5	TERMINAL	8
5	PROTECTION	9
5.1	ALARM	9
5.2	SHUTDOWN ALARM	10
6	PROGRAMMABLE PARAMETERS	11
6.1	CONTENTS AND SCOPES OF PARAMETERS	11
7	COMMISIONING	16
8	SYSTEM DIAGRAM	16
9	CASE DIMENSION AND INSTALLATION	17
10	FAULT FINDING	18





Chinese trademark

SmartGen English trademark

SmartGen — make your generator *smart*

SmartGen Technology Co., Ltd.

No.28 Jinsuo Road

Zhengzhou

Henan Province

P. R. China

Tel: 0086-371-67988888/67981888

0086-371-67991553/67992951

0086-371-67981000(overseas)

Fax: 0086-371-67992952

Web: <http://www.smartgen.com.cn>

<http://www.smartgen.cn>

Email: sales@smartgen.cn

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Software Version

Date	Version	Note
2016-08-21	1.0	Original release.

1 OVERVIEW

CMM363-2G controller used for a single generator set monitoring communication system with the functions of data measurement and alarm protection. Generator set information collected by CMM363-2G will be sent to corresponding cloud server via GPRS to ensure genset can connected to the internet. Then the module transmits the data to corresponding cloud server via GPRS wireless network for achieving user's real-time monitoring to running status and searching of running records via APP (IOS or Android) and pc terminal devices.

CMM363-2G controller has the GPS locate function and upload longitude and attitude information and elevation information to its relevant cloud server.

2 PERFORMANCE AND CHARACTERISTICS

- 1) Connected to cloud server via GPRS 2G wireless network.
- 2) With ARM-based 32-bit SCM, high integration of hardware and strong programming ability.
- 3) Include with GPS locate function to achieve gain location information and locate genset.
- 4) Take JSON network data communication protocol, upload real-time data variation and take compression algorithm to vastly reduce network flow at the same time.
- 5) Cloud transfer trigger mode: when the power frequency exceeds 0, CMM363-2G controller upload data according to the real-time interval to upload data. Otherwise, if timing upload is enabled, it will trigger transmission on the basis of pre-set upload interval. Constant transmit 2minutes a time. If set cloud transport trigger input, and input port effective, constant transmit will according to the pre-set upload interval.

▲ NOTE: During each constant transmission, upload must be abided by the real-time data upload interval.

- 6) Collect with single-phase voltage, single-phase current, frequency and power (active, reactive, apparent, power factor) and accumulate active energy. CMM363-2G controller is suit for three-phase four-wire, three-phase three-wire, single-phase tri-wire, two-phase three-wire(120/240V) power 50/60Hz system.
- 7) Generate electricity with functions of over voltage, under voltage, over frequency, under frequency, over current and over power.
- 8) Two analog input ports, which not only can be set to temperature or pressure and liquid level sensor, but also can be set to switch input port.
- 9) Precision engine parameters as follow:
 - Temperature WT unit: °C
 - Engine oil pressure OP unit: kPa
 - Fuel level FL unit: %
 - Battery voltage VB unit: V
- 10) Parameter setting function: users can setting and change parameters. Parameters will be remembered into the internal FLASH memory to avoid data loss when power interruption of a

system. All parameters are adjusted via PC through the LINK interface.

- 11) A variety of temperature, pressure, and oil level sensor curve can be used directly and be customized.
- 12) Widely power supply: DC (8~35) V, can adapt to different battery voltage environment.
- 13) 1 auxiliary relay output ports which can output several of alarm signals.
- 14) Power and multiple communication status indicators on front panel that working status is clear at a glance.
- 15) Lamp test function;
- 16) Parameter adjust function: users can adjust parameters via USB port;
- 17) Take standard π -type 35mm guide-rail installation or screw-fixed installation that the module can be installed in the genset control box;
- 18) Modular design, self extinguishing ABS plastic shell, light weight, compact structure with easy installation.

3 SPECIFICATION

Items	Contents
Operating Voltage	DC 8.0V~35.0V, continuous power supply.
AC Generator Voltage Input	Single-phase tri-wire system AC 15V - 360V (ph-N)
AC Generator Frequency	50/60Hz
Analog Input	Resistor Type
Auxiliary Input	Digital Input, connect (B-) is active.
Auxiliary Output	1A DC30V Volts free output
LINK	SmartGen exclusive port
USB Device	B-type USB mother port
GPRS Port	Standard SMA port (female), SMA port (male) for antenna.
GPS Port	Standard SMA port (female), SMA port (male) for antenna, active antenna.
Wireless Network	GPRS 2G
Case Dimensions	73mmx105mmx33mm
Ct Secondary Current	5mA
Working Conditions	Temperature: (-30~+70)°C Humidity: (20~93)%RH
Storage Condition	Temperature: (-40~+80)°C
Weight	0.15kg

4 PANEL AND TERMINAL DESCRIPTION

4.1 PANEL INDICATION AND BUTTONS



Icon	Note
POWER	Green LED Light: Cloud transmission communication normal Red LED Light: Power supply indicator
ALARM(Red)	Normally Extinguish: Alarm free 0.5s Blink: Outage alarm 1s Blink: Warning alarm
GPRS(Red)	Normally Extinguish: No GPRS network Normally Light: Connect with server successfully Blink: Real-time data communication normal
GPS(Red)	Normally Extinguish: GPS disabled Normally Light: GPS not gained satellite signal Blink: GPS gained satellite signal
LINK(Red)	Normally Extinguish: Disabled Normally Light: Communicate with PC normal
Voltage(Red)	Normally Extinguish: No power or abnormal power Normally Light: Power normal
FREQ(Red)	Extinguish: No power or abnormal power frequency Normally Light: Frequency normal

Lamp test/Reset:

Press this button for 1s, all the LEDs are illuminated; press for 10s, reset the module to default and all the LEDs blink for 3 times.

▲ NOTE: After reset the module, set up the parameters via PC software is recommended. Please operate cautiously.

▲ NOTE: Without insert SIM card, GPRS indicator and GPS indicator blink at the same time.

4.2 GPRS

Connect GPRS antenna to GRPR/3G port.

Antenna: 50Ω/SMA female.

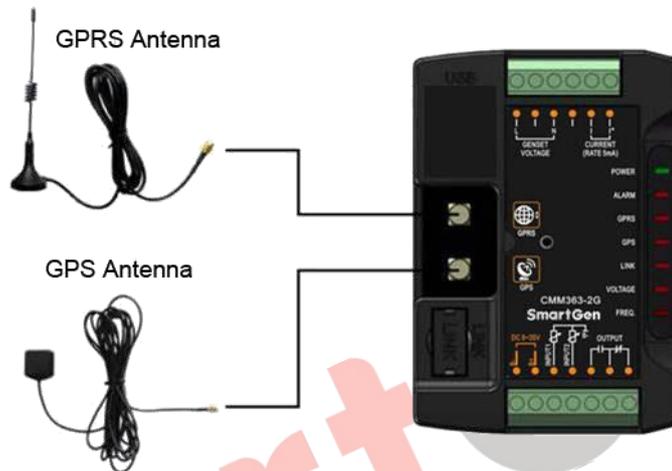
4.3 GPS

GPS enabled, connect GPS antenna to CMM363-2G.

▲ Note: GPS antenna needs to be placed to open outdoors, otherwise location information may not accurate or cannot be gained.

Antenna: 50Ω/SMA female, active antenna.

▲ Note: GPRS antenna and GPS antenna cannot be connected reversely.



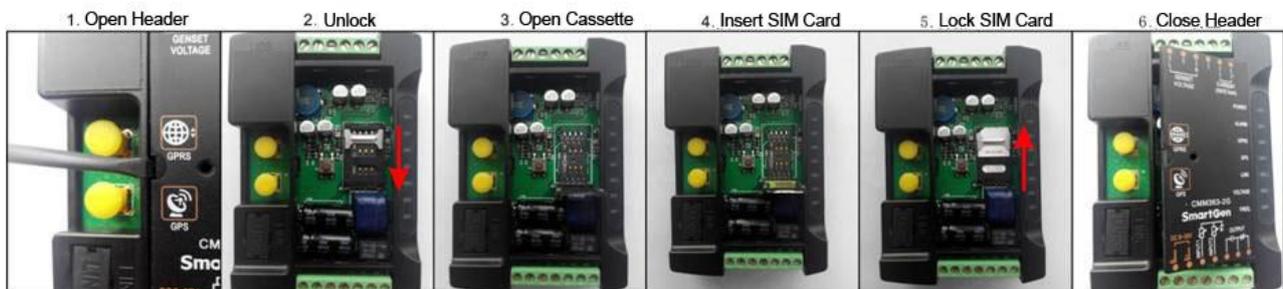
CMM363-2G Antenna Connection

4.4 SIM INSTALLATION

Insert SIM card, CMM363-2G will connect to servers via GPRS network.

▲ Note: Only mobile and Unicom network are supported. Use standard SIM card (25mmX15mm); If GPS indicator and GPRS indicator blink in the same time, which means SIM card hasn't been inserted or bad contacts.

After detached head cover, the installation steps are as below:



4.5 TERMINAL

No.	Function		Cable Size	Note
1	B-		1.0mm ²	Connected with negative of starter battery.
2	B+		1.0mm ²	Connected with positive of starter battery. 3A fuse is recommended.
3	Aux. Input 1		1.0mm ²	Connect analog sensors
4	Aux. Input 2		1.0mm ²	Connect analog sensors
5	Aux. Output	Normally Open	1.0mm ²	Normally open outputs, rated 1A DC30V
6		Common	1.0mm ²	
7		Normally Close	1.0mm ²	
8	Gen A-phase Voltage Monitoring Input		1.0 mm ²	Connect genset output A phase(Recommend 2A fuse)
9	Empty			
10	Genset N Line Input		1.0mm ²	Connect genset output N line
11	Empty			
12	Current Transformer A-phase Monitoring Input		0.5 mm ²	External current transformer secondary coil(rated 5mA)
13	Current Transformer Common Terminal		0.5 mm ²	Check the installation instructions for more details

5 PROTECTION

5.1 ALARM

When warning signals been detected, the controller only warning not closing down.

Controller warning parameters as below:

No.	Type	Description
1	Over-frequency	Controller issued warning signal when detected genset frequency over the pre-set alarm threshold.
2	Under-frequency	Controller issued warning signal when detected genset frequency under the pre-set alarm threshold and over the under-frequency protection input threshold.
3	Over-voltage	Controller issued warning signal when detected genset voltage over the pre-set alarm threshold.
4	Under-voltage	Controller issued warning signal when detected genset voltage under the pre-set alarm threshold and over the protection input threshold.
5	Over-current	Controller issued warning signal when detected genset current over the pre-set alarm threshold, if the action select alarm.
6	Over-power	Controller issued warning signal when detected genset power over the pre-set alarm threshold, if the action select alarm.
7	Battery Over-voltage	Controller issued warning signal when detected genset battery voltage over the pre-set alarm threshold.
8	Battery Under-voltage	Controller issued warning signal when detected genset battery voltage under the pre-set alarm threshold.
9	Flexible Sensor1 Open Circuit	Controller issued warning signal when detected open circuit, if the action select alarm.
10	Flexible Sensor1 High	Controller issued warning signal when detected sensors numerical value is greater than the pre-set upper limit warning and the power frequency over the protection input threshold.
11	Flexible Sensor1 Low	Controller issued warning signal when detected sensors numerical value is lower than the pre-set floor limit warning and the power frequency over the protection input threshold.
12	Flexible Sensor2 Open Circuit	Controller issued warning signal when detected open circuit, if the action select alarm.
13	Flexible Sensor2 High	Controller issued warning signal when detected sensors numerical value is greater than the pre-set upper limit warning and the power frequency over the protection input threshold.
14	Flexible Sensor2 Low	Controller issued warning signal when detected sensors numerical value is lower than the pre-set floor limit warning and the power frequency over the protection input threshold.
15	Digital Input	Controller issued relevant digital input port warning signal when flexible sensor set to switch input port and the alarm is active.

5.2 SHUTDOWN ALARM

Shutdown alarm immediate output when the controller detects shutdown alarm signal.

Shutdown alarms as below:

No.	Type	Description
1	Over-frequency	When the controller detects that the genset frequency has exceeded the pre-set value, it will initiate a shutdown alarm.
2	Under-frequency	When the controller detects that the genset frequency has fallen below the pre-set value and over the protection input threshold, it will initiate a shutdown alarm.
3	Gen Over-voltage	When the controller detects that the generator voltage has exceeded the pre-set value, the controller will initiate a shutdown alarm.
4	Gen Under-voltage	When the controller detects that the genset voltage has fallen below the pre-set value and over the protection input threshold, it will initiate a shutdown alarm.
5	Gen Over-current	When the controller detects that the genset current has exceeded the pre-set value and the action select "Shutdown", it will initiate a shutdown alarm.
6	Over Power	If over power detection is enabled, when the controller detects that the over power value (power is positive) has exceeded the pre-set value and the action select "Shutdown", it will initiate a shutdown alarm.
7	Flexible Sensor 1 Open Circuit	When the controller detects that the flexible sensor 1 is open circuit and the action select "Shutdown", it will initiate a shutdown alarm.
8	Flexible Sensor 1 High	When the controller detects that the sensor 1 value has exceeded the pre-set value and the power frequency exceed protection input threshold, it will initiate a shutdown alarm.
9	Flexible Sensor 1 Low	When the controller detects that the sensor 1 value has fallen below the pre-set value and the power frequency exceed protection input threshold, it will initiate a shutdown alarm.
10	Flexible Sensor 2 Open Circuit	When the controller detects that the flexible sensor 2 is open circuit and the action select "Shutdown", it will initiate a shutdown alarm.
11	Flexible Sensor 2 High	When the controller detects that the sensor 2 value has exceeded the pre-set value and the power frequency exceed protection input threshold, it will initiate a shutdown alarm.
12	Flexible Sensor 2 Low	When the controller detects that the sensor 2 value has fallen below the pre-set value and the power frequency exceed protection input threshold, it will initiate a shutdown alarm.
13	Digital Input	When digit input port is set as shutdown and the alarm is active, it will initiate a shutdown alarm.

▲ Note: When controller detects the frequency is 0, all the shutdown alarms except for switching value shutdown alarm will automatic remove shutdown alarm after delay 5s.



6 PROGRAMMABLE PARAMETERS

6.1 CONTENTS AND SCOPES OF PARAMETERS

No.	Items	Parameters	Default	Description
Module Setting				
1	Time Zone	(-12-12)	8	Setting time zone.
2	Address	(1-254)	1	Address of controller when remote control.
3	History Data Interval	(0-3600)s	0	History data upload interval. Note: 0s do not upload data.
4	Real-time Data Upload Interval	(1-20)s	5	Real-time data upload interval.
5	Timing Upload Enabled Set	(0-1)	0	0: Disable; 1: Enable
6	Timing Data Upload Interval	(0-600000)min	600	Timing upload enabled, the pre-set time interval will trigger cloud data transmission for 2 minutes.
Gateway Setting				
1	Website	(0-65535)	20 Chinese characters, letters or numbers	
2	URL	(0-65535)	monitor.smartgen.com.cn	40 characters
3	Server Port	(0-65535)	50158	
4	Password	(0-65535)	123456	16 characters
GPS Setting				
1	GPS Enabled	(0-1)	1	0: Manual input 1: Using GPRS for location.
2	Longitude	(-180-180)°	0.000000	GPS location, altitude
3	Latitude	(-90-90)°	0.000000	
4	Altitude	(-9999.9-9999.9)	100.0	
GSM Setting				
1	GSM Enabled	(0-1)	1	0:Disabled; 1:Enabled
2	GPRS Password	Reserved		
3	SMSNO	Reserved		
Generator Setting				
1	AC System Supply	(0-3)	3	0: Three-phase four-wire 3P4W; 1: Three-phase three-wire 3P3W; 2: Two-phase three-wire 2P3W; 3: Single phase 1P2W
2	Nominal Voltage	(30-30000)V	230	Provide standard for over-voltage and under-voltage. If use voltage transformer, it is the transformer primary voltage.
3	Nominal Frequency	(10.0-75.0)Hz	50.0	Provide standard for over-voltage and under-voltage.
4	Voltage	(0-1)	0	0: Disabled; 1: Enabled



	Transformer			
5	Over-voltage Shutdown	(0-200)%	120	Protection on input threshold value is percentage of gen rated voltage. Delay also can be set.
6	Under-voltage Shutdown	(0-200)%	80	
7	Over-frequency Shutdown	(0-200)%	114	Protection input threshold value is percentage of gen rated frequency. Delay value also can be set
8	Under-frequency Shutdown	(0-200)%	80	
9	Over-voltage Alarm	(0-1000)%	110	Protection input threshold value is percentage of gen rated voltage. Delay and returned value also can be set.
10	Under-voltage Alarm	(0-1000)%	84	
11	Over-frequency Alarm	(0-1000)%	110	Setting value, protection input threshold value is percentage of gen rated frequency. Delay and returned value also can be set.
12	Under-frequency Alarm	(0-1000)%	84	
13	Battery Nominal Voltage	(0-60.0)V	12.0	Provide standard for battery over-voltage and under-voltage.
14	Battery Over-voltage Alarm	(0-200)%	120	Setting value is percentage of battery rated voltage. Delay and returned value also can be set.
15	Battery Under-voltage Alarm	(0-200)%	85	
Load Setting				
1	Current Transformer Changing-ratio	(5-6000)/5mA	30	An external variable ratio of current transformer.
2	Rated Full-load Current	(5-6000)A	30	Gen rated current is the standard of the load current.
3	Rated Power	(0-6000)Kw	5	Gen rated power is the standard of the load current.
4	Over-current	(0-200)%	120	Setting value is percentage of rated full-load current. Delay value can be set to fixed time-lag or inverse time lag.
5	Over-power	(0-1)	0	0: Disabled; 1: Enabled.
Analog Input Setting				
Flexible Sensor 1 Setting				
1	Sensor Option	(0-4)	1	Factory default: temperature sensor
2	Curve Type	(0-15)	7 SGX	0: Close active; 1: Break active See: Form 3
3	Open Circuit	(0-1)	0	0: Warning; 1:Downtime
4	Protection Input Frequency threshold	(0-200)%	50	When gen frequency fall below protection input frequency, flexible sensor has no protected function.



5	High Downtime	(0-1000) °C	98	When external sensor's temperature exceeds 98, high downtime alarm will be initiated. Only when protection input is valid, will it start to judge. Delay value can be set.
6	Low Downtime	(0-1000) °C	10	When external sensor's temperature fall below 10, low downtime alarm will be initiated. Only when protection input is valid, will it start to judge. Delay value can be set.
7	High Alarm	(0-1000) °C	95	When external sensor's temperature exceeds 95, high temperature warning alarm will be initiated. Only when protection input is valid, will it start to judge. Delay value can be set.
8	Low Alarm	(0-1000) °C	70	When external sensor's temperature fall below 70, low temperature warning alarm will be initiated. Only when protection input is valid, will it start to judge. Delay value can be set.
Flexible Sensor2 Setting				
1	Sensor Option	(0-4)	4	Factory default: Switching value
2	Protection Input Frequency threshold	(0-200)%	0	If gen frequency fall bellow protection input frequency threshold, input port is ineffective.
3	Input Content	(0-9)	4	Factory default : Cloud transport trigger input. See: Form 1
4	Input Effect Type	(0-1)	0	0: Closed active; 1: Open active.
5	Input Valid Delay	(0-20.0)	2.0	Input action delay.
6	Cloud Transmission Duration	(1-1000)min	1	After cloud transmission triggered input actively, data transmit duration.
Switching Value Output Setting				
1	Output	(0-34)	1	Factory default : Network communication output failure. See: Form 2



Form1

No.	Item	Description
0	Not Used	Not used.
1	Lamp Test	All the indicators are illuminated when input is active.
2	Warning Alarm Input	Only warning without stopping when input is active.
3	Stop Alarm Input	Stop alarm output when input is active.
4	Cloud Transport Trigger Input	Transmit real time data to the server when input is active.
5	Temperature High Input Stop	Controller send out temperature high stop alarm when input is active.
6	Oil Pressure Low Input Stop	Controller send out oil pressure low stop alarm when input is active.
7	Reserved	
8	Reserved	
9	Reserved	

Form 2

No.	Item	Description
0	Not used	Output port won't output when this item is selected.
1	Network Comm. Fail	Modules communicated with server fails.
2	Warning Alarm Output	Public warning alarm action.
3	Stop Alarm Output	Public stop alarm action.
4	Public Alarm Output	Gen public warning and stop alarm action.
5	Reserved	
6	Reserved	
7	Reserved	
8	Reserved	
9	Reserved	
10	Over-frequency Alarm	Gen Over-frequency alarm action.
11	Over-frequency Stop Alarm	Gen over-frequency stop alarm action.
12.	Over-voltage Alarm	Gen over voltage alarm action.
13	Over-voltage Stop Alarm	Gen over voltage stop alarm action.
14	Under-frequency Alarm	Gen under frequency alarm action.
15	Under-frequency Stop Alarm	Gen under frequency stop alarm action.
16	Under-voltage Alarm	Gen under voltage alarm action.
17	Under-voltage Stop Alarm	Gen under voltage stop alarm action.
18	Over-power Alarm	Over power warning alarm or stop alarm output action.
19	Sensor 1 Open Circuit	Sensor 1 open circuit alarm action.
20	Sensor 1 Low Alarm	Sensor 1 low warning alarm action.
21	Sensor 1 Low Stop Alarm	Sensor 1 low stop alarm action.
22	Sensor 1 High Alarm	Sensor 1 high warning alarm action.
23	Sensor 1 High Stop Alarm	Sensor 1 low stop alarm action.



24	Sensor 2 Open Circuit	Sensor 2 open circuit alarm action.
25	Sensor 2 Low Alarm	Sensor 2 low warning alarm action.
26	Sensor 2 Low Stop Alarm	Sensor 2 low stop alarm action.
27	Sensor 2 High Alarm	Sensor 2 high warning alarm action.
28	Sensor 2 High Stop Alarm	Sensor 2 low stop alarm action.
29	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	Reserved	
34	Reserved	

Form3

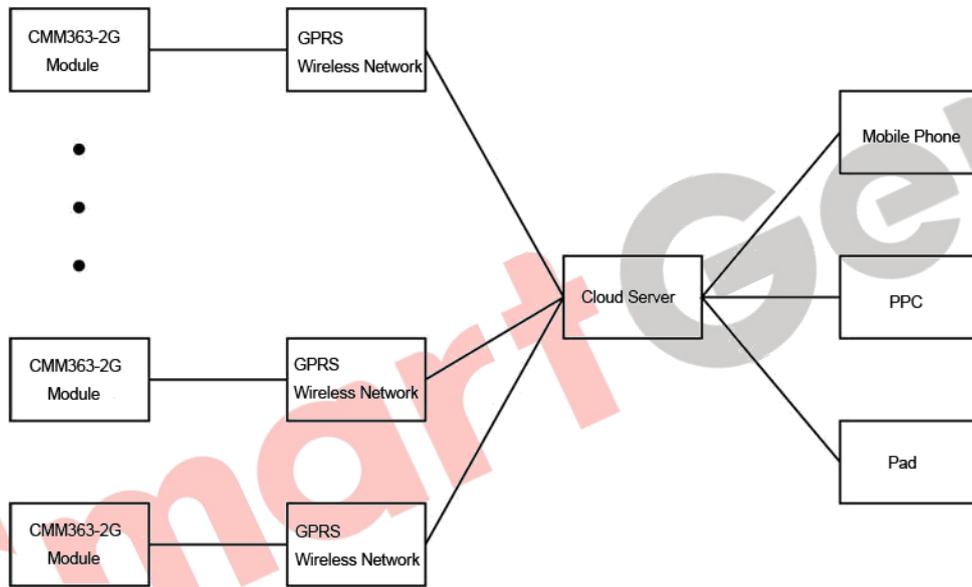
No.	Item	Content	Note
1	Temperature Sensor	0 Nonuse 1 Customized resistor type 2 Customized 4-20mA 3 VDO 4 CURTIS 5 VOLVO-EC 6 DATCON 7 SGX 8 SGD 9 SGH 10-15 Reserved	Customized resistor type input scope: 0Ω-6000Ω Factory default: SGX sensor
2	Pressure Sensor	0 Nonuse 1 Customized resistor type 2 Customized 4-20mA 3 VDO 10Bar 4 CURTIS 5 VOLVO-EC 6 DATCON 10Bar 7 SGX 8 SGD 9 SGH 10-15 Reserved	Customized resistor type input scope: 0Ω-6000Ω Factory default: SGX sensor

7 COMMISSIONING

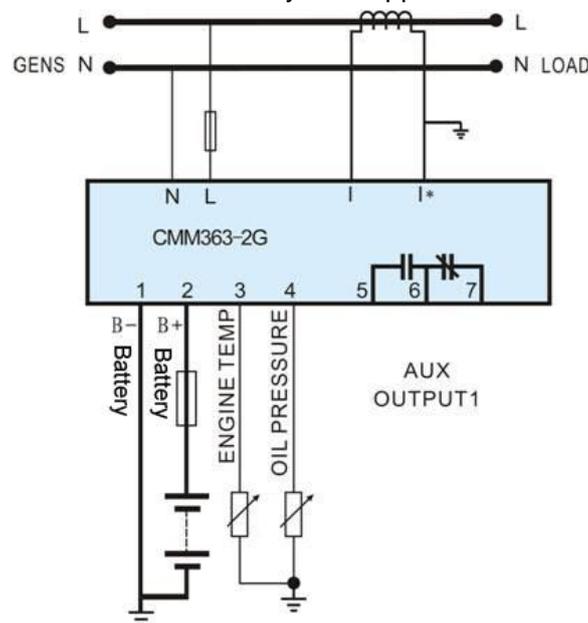
Before the formal operation, suggest do checks as bellow:

- 1) Confirm all wiring correct and the wire diameter suitable.
- 2) Confirm module DC working power installed fuse and positive and negative electrode which connected to starter battery connect correctly.
- 3) Confirm GPS antenna placed open outdoor, otherwise, location information will not be found or inaccuracy.
- 4) Confirm insert SIM card.
- 5) Confirm POWER indicator turns to green, which means cloud monitoring module connected to the cloud platform successfully.
- 6) Confirm module's ID be added to the register account through cloud sever platform. Ten real time data can be checked.
- 7) Any other problems please contact with SmartGen service.

8 SYSTEM DIAGRAM

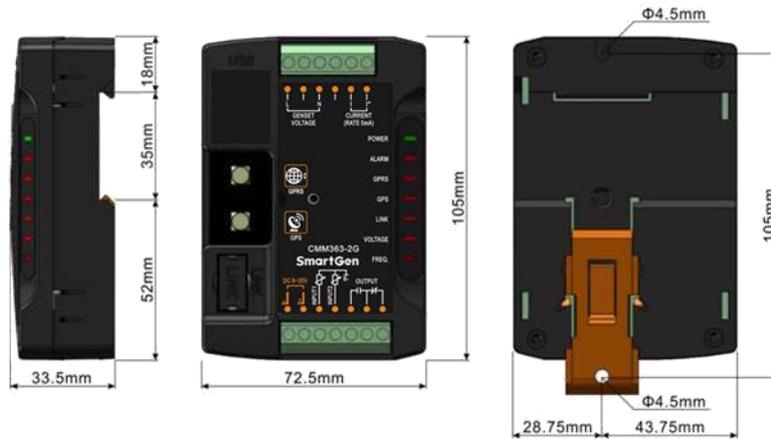


CMM363-2G System Application



CMM363-2G Typical Application

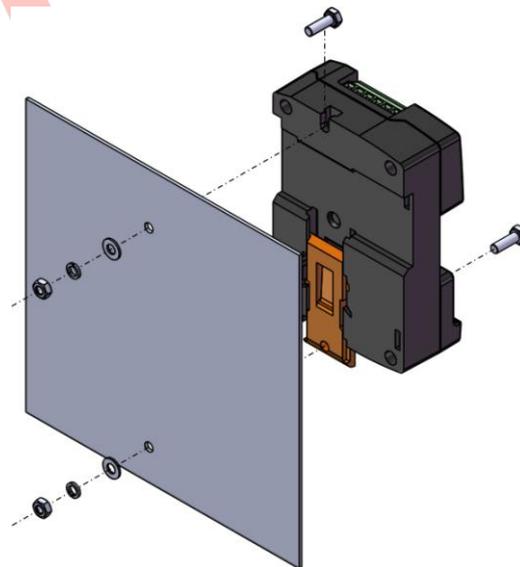
9 CASE DIMENSION AND INSTALLATION



CMM363-2G Case Dimension



CMM363-2G Guide Rail Installation



Screw Installation

1) AC Input

Controller current input must connect with CT and CT secondary current must be 5mA. Meanwhile, phase of CT and phase of voltage must be correct. Otherwise, the sample current and the active power may be incorrect.

▲ Note: ICOM perminal must be connected with controller negtive electrode.

⚠ Warning: Transformer secondary side is forbidden to open circuit when with load current.

2) High Voltage Test

▲ Caution: If controller has been installed into control panel, when do High voltage tests, amphenol connectors of controller must be disconnect to avoid high voltage damage the controller.

10 FAULT FINDING

Symptoms	Possible Solutions
Controller no response with power.	Check power voltage; Check controller connection wirings.
GPRS Indicator Not Light	Check SIM card is inserted or not; Check GPRS antenna is connected or not.
GPS Not Gained Location	Check GPS parameters are enabled or not; Check GPS antenna is connected or not and placed outdoor or not.
LINK Communication Abnormal	Check connections; Check COM port is correct or not; Check PC communication port is damaged or not.