SmartGen
MAKING CONTROL SMARTER

HGM6110Z/HGM6120Z

GENSET CONTROLLER

COMMUNICATION PROTOCOL
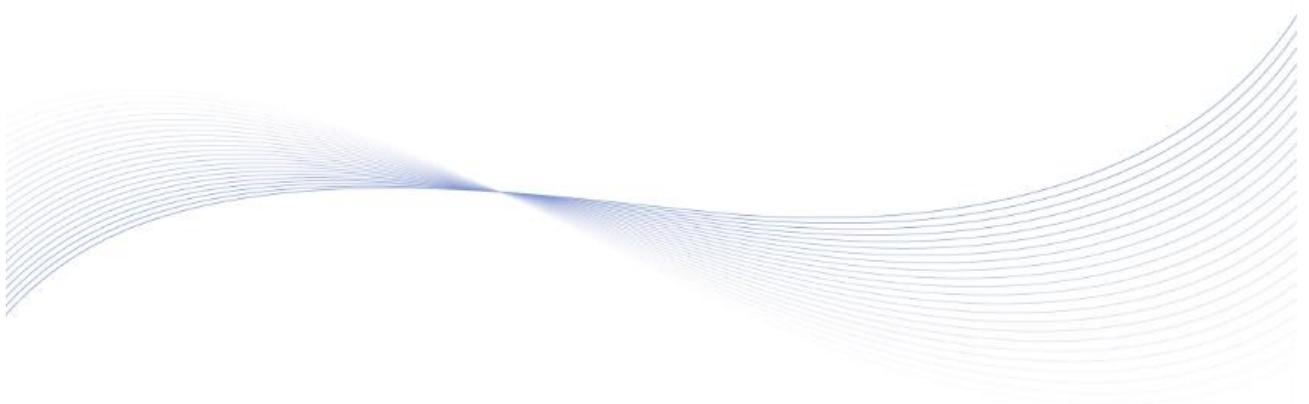
SmartGen

SmartGen **Registered trademark**

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Table 1 Software Version

Date	Version	Content
2024-03-08	V1.0	Original release.
2024-07-04	V1.1	1. Update new contents of 03 function code; 2. Add support for HGM6100LT series genset controller.
2024-07-26	V1.2	Update new contents of 03 function code (0083 and 0169).
2025-07-03	V1.3	1. Update the content of HGM6100LT 03 function code (70-71 & 105-119); 2. Update the content and ratio of HGM6100LT and HGM6100Z 03 function code.
2025-10-22	V1.4	1. Remove the protocol of HGM6100LT; 2. Modify some items displayed in 01H function code coil data field.

CONTENTS

1 DESCRIPTION

This protocol describes the controller RS485 half-duplex serial port's read and write command format, and the definition of internal information & data for the third-party to develop and use.

There is one RS485 port on the HGM6100Z series genset controller. The controller works as a slave module, and uses Modbus-RTU protocol, but it doesn't support other protocols, such as Modbus-ASCII, etc.

Frame format:
Communication address: 1~254 (Default: 1)
Baud rate: 9600bps (2400/4800/9600/19200/115200bps as configurable)
Start bit: 1 bit
Data bit: 8 bits
Parity bit: no bit for no parity, 1 bit for even or odd parity (Default: no parity)
Stop bit: 1 bit

Function code supported: 01H, 03H, 05H, 06H. Function code 01H is used for reading various coil status inside the controller (such as close, open, fault of breaker, auto or manual status, etc.); Function code 03H is used for reading value register inside the controller (value register saves various set value of analog data and parameters); Function code 05H is used for sending remote command; Function code 06H is used for saving a single value into the single register inside the controller.

Error checking method: CRC16.

The register data inside the controller are packed as two bytes per register.

Communication timeout period: over 200ms.

Transmission distance: At a baud rate of 9600bps, the maximum distance can reach up to 1,000 meters with 120-ohm shielded twisted pair cable.

A maximum of 120 registers can be read per request.

It can support the communication of 32 networked controllers.

RS485 cabling must use 120-ohm shielded twisted pair cable, and one end of the shield should be grounded.

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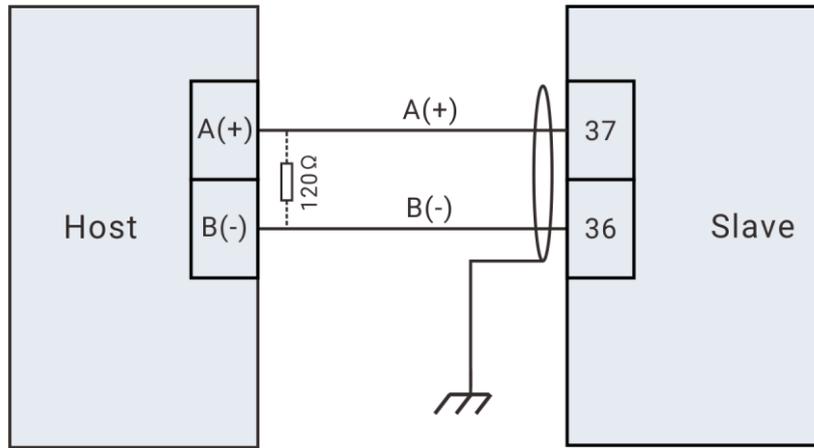
2 WIRING DIAGRAM

Figure 1 Single Device Communication Wiring Diagram

NOTE 1: The 120Ω resistor at controller side can be set by the matched resistor enable setting. When it is enabled, the internal 120Ω resistor of controller is connected with the RS485A and RS485B in parallel. (default configuration is enabled)
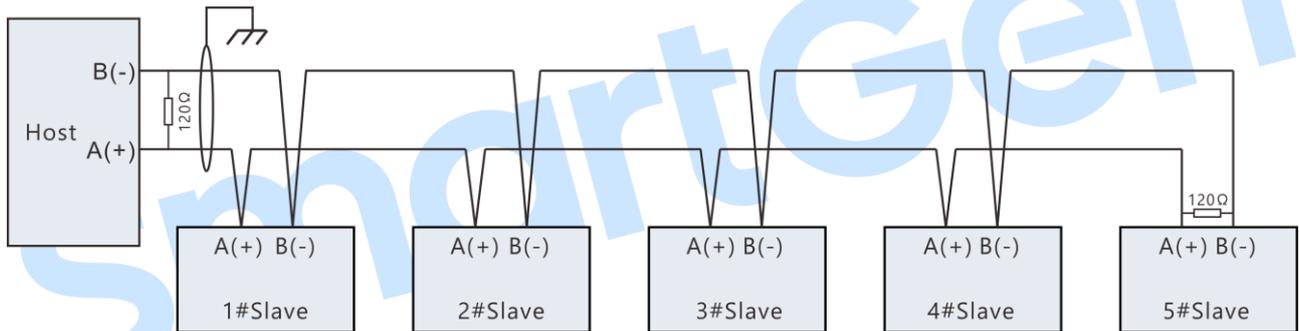
Figure 2 Multiple Devices Communication Wiring Diagram

NOTE 1: Please configure each controller's communication module address before networking. Same module address is not allowed in one network.

NOTE 2: One end of the communication cable shield should be grounded at the host side.

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3 CONTROLLER INTERNAL REGISTER ADDRESS AND DATA

3.1 FUNCTION CODE 01H MAPPING COIL FIELD

Table 2 Alarm and Coil Status of Data Field

| Modbus Address	PLC Address	Item	Description
0000	0001	Common Alarm	"0" means there is no common alarm "1" means there are common alarms The content listed below follows the same rule
0001	0002	Common Warning	1 as active
0002	0003	Common Shutdown	1 as active
0003	0004	Remote Mode	1 as active
0004	0005	Battle Mode	1 as active
0005	0006	Reserved	1 as active
0006	0007	Mains On-load	1 as active
0007	0008	Gen. On-load	1 as active
0008	0009	Emergency Stop	1 as active
0009	0010	Overspeed Shutdown	1 as active
0010	0011	Underspeed Shutdown	1 as active
0011	0012	Loss of Speed Signal Shutdown	1 as active
0012	0013	Overfrequency Shutdown	1 as active
0013	0014	Underfrequency Shutdown	1 as active
0014	0015	Overvoltage Shutdown	1 as active
0015	0016	Undervoltage Shutdown	1 as active
0016	0017	Gen. Overcurrent Shutdown	1 as active
0017	0018	Crank Failure	1 as active
0018	0019	High Water Temp. Shutdown	1 as active
0019	0020	Low Oil Pressure Shutdown	1 as active
0020	0021	No Gens Shutdown	1 as active
0021	0022	Input Shutdown	1 as active
0022	0023	Low Fuel Level Shutdown	1 as active
0023	0024	Low Coolant Level Shutdown	1 as active
0024	0025	High Water Temp. Warning	1 as active
0025	0026	Low Oil Pressure Warning	1 as active
0026	0027	Gen. Overcurrent Warning	1 as active
0027	0028	Stop Failure Warning	1 as active
0028	0029	Low Fuel Level Warning	1 as active
0029	0030	Charging Failure Warning	1 as active
0030	0031	Battery Undervoltage Warning	1 as active
0031	0032	Battery Overvoltage Warning	1 as active
0032	0033	Input Warning	1 as active
0033	0034	Loss of Speed Signal Warning	1 as active
0034	0035	Low Coolant Level Warning	1 as active

Modbus Address	PLC Address	Item	Description
0035	0036	Temp. Sensor Open Warning	1 as active
0036	0037	OP Sensor Open Warning	1 as active
0037	0038	Maintenance Due Warning	1 as active
0038	0039	Charger Failed to Charge Warning	1 as active
0039	0040	Over Power Warning	1 as active
0040	0041	In Test Mode	1 as active
0041	0042	In Auto Mode	1 as active
0042	0043	In Manual Mode	1 as active
0043	0044	In Stop Mode	1 as active
0044	0045	Temp. Sensor Open Shutdown	1 as active
0045	0046	OP Sensor Open Shutdown	1 as active
0046	0047	Maintenance Due Shutdown	1 as active
0047	0048	Over Power Shutdown	1 as active
0048	0049	Emergency Stop Input	1 as active
0049	0050	Aux. Input 1	1 as active
0050	0051	Aux. Input 2	1 as active
0051	0052	Aux. Input 3	1 as active
0052	0053	Aux. Input 4	1 as active
0053	0054	Aux. Input 5	1 as active
0054	0055	Short Circuit Warning	1 as active
0055	0056	Self-defined Input 1 Warning	1 as active
0056	0057	Start Relay Output	1 as active
0057	0058	Fuel Relay Output	1 as active
0058	0059	Aux. Output 1	1 as active
0059	0060	Aux. Output 2	1 as active
0060	0061	Aux. Output 3	1 as active
0061	0062	Aux. Output 4	1 as active
0062	0063	Reserved	1 as active
0063	0064	Reserved	1 as active
0064	0065	Mains Abnormal	1 as active
0065	0066	Mains Normal	1 as active
0066	0067	Mains Overvoltage	1 as active
0067	0068	Mains Undervoltage	1 as active
0068	0069	Mains Phase Loss	1 as active
0069	0070	Mains Blackout	1 as active
0070	0071	Reserved	1 as active
0071	0072	Reserved	1 as active
0072	0073	Gen. Normal	1 as active
0073	0074	Gen. Overvoltage	1 as active
0074	0075	Gen. Undervoltage	1 as active
0075	0076	Gen. Overfrequency	1 as active
0076	0077	Gen. Underfrequency	1 as active
0077	0078	Gen. Overcurrent Indication	1 as active

Modbus Address	PLC Address	Item	Description
0078	0079	Scheduled Not Run	1 as active
0079	0080	ECU Warning	1 as active
0080	0081	ECU Shutdown	1 as active
0081	0082	ECU Comm. Failure Alarm	1 as active
0082	0083	Short Circuit Shutdown	1 as active
0083	0084	Self-defined Input 2 Warning	1 as active
0084	0085	Self-defined Input 3 Warning	1 as active
0085	0086	Self-defined Input 4 Warning	1 as active
0086	0087	Self-defined Input 5 Warning	1 as active
0087	0088	Reserved	1 as active
0088	0089	Self-defined Input 1 Shutdown	1 as active
0089	0090	Self-defined Input 2 Shutdown	1 as active
0090	0091	Self-defined Input 3 Shutdown	1 as active
0091	0092	Self-defined Input 4 Shutdown	1 as active
0092	0093	Self-defined Input 5 Shutdown	1 as active
0093	0094	Reserved	1 as active
0094	0095	Reserved	1 as active
0095	0096	Reserved	1 as active
0096	0097	Driver Alarm	1 as active
0097	0098	Water in Fuel	1 as active
0098	0099	SYS	1 as active
0099	0100	DPF Carbon Deposit	1 as active
0100	0101	DPF Regeneration	1 as active
0101	0102	DPF Regeneration Inhibit	1 as active
0102	0103	High Exhaust Temp.	1 as active
0103	0104	DPF Regeneration Reminder	1 as active
0104	0105	No Closing for On-load in Regeneration	1 as active
0105	0106	Reserved	1 as active
0106	0107	Reserved	1 as active
0107	0108	Reserved	1 as active
0108	0109	Reserved	1 as active
0109	0110	Reserved	1 as active
0110	0111	Reserved	1 as active
0111	0112	Reserved	1 as active

Example:

If the status of "Emergency Stop" and "Input Warning" needs to be read, check the table above and find their coil addresses are 0008 and 0032, so it needs to read 40 coils.

Assuming the slave (controller) address is 01, the master or host (could be PC) request command is as following:

Table 3 Master (PC) Request Frame

Slave Address	Function Code	Start Address (0000)		Request Data Qty. (40)		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**01**	**00**	**00**	**00**	**28**	**3C**	**14**

The slave response is as following:

Table 4 Slave (Controller) Response Frame

Slave Address	Function Code	Data Qty. (Bytes)	Data					CRC 16	
			Data of Address 07-00	Data of Address 15-08	Data of Address 23-16	Data of Address 31-17	Data of Address 39-32	LSB	MSB
01	**01**	**05**	**07**	**01**	**00**	**00**	**01**	**E4**	**AE**

Table 5 Data Analysis

Address	Data Received (Hex)	Convert to Binary	Meaning
Data of Address 15-08	01H	0000 0000 0000 0001	Data of 08 is 1, which means status of "Emergency Stop" is active.
Data of Address 39-32	01H	0000 0000 0000 0001	Data of 32 is 1, which means status of "Input Warning" is active.

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3.2 FUNCTION CODE 03H MAPPING DATA FIELD OF PARAMETERS

Table 6 Data Field of Parameters

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0000	40001	Mains UA		1	V	Unsigned	2Bytes
0001	40002	Mains UB		1	V	Unsigned	2Bytes
0002	40003	Mains UC		1	V	Unsigned	2Bytes
0003	40004	Mains UAB		1	V	Unsigned	2Bytes
0004	40005	Mains UBC		1	V	Unsigned	2Bytes
0005	40006	Mains UCA		1	V	Unsigned	2Bytes
0006	40007	Mains Frequency		0.1	Hz	Unsigned	2Bytes
0007	40008	Gen. UA		1	V	Unsigned	2Bytes
0008	40009	Gen. UB		1	V	Unsigned	2Bytes
0009	40010	Gen. UC		1	V	Unsigned	2Bytes
0010	40011	Gen. UAB		1	V	Unsigned	2Bytes
0011	40012	Gen. UBC		1	V	Unsigned	2Bytes
0012	40013	Gen. UCA		1	V	Unsigned	2Bytes
0013	40014	Gen. Frequency		0.1	Hz	Unsigned	2Bytes
0014	40015	Phase A Current		1	A	Unsigned	2Bytes
0015	40016	Phase B Current		1	A	Unsigned	2Bytes
0016	40017	Phase C Current		1	A	Unsigned	2Bytes
0017	40018	Water Temp. Value		1	℃	Unsigned	2Bytes
0018	40019	Water Temp. Resistance Value		0.1	Ω	Unsigned	2Bytes
0019	40020	Oil Pressure Value		1	kPa	Unsigned	2Bytes
0020	40021	OP Resistance Value		0.1	Ω	Unsigned	2Bytes
0021	40022	Level Value		1	%	Unsigned	2Bytes
0022	40023	Level Resistance Value		0.1	Ω	Unsigned	2Bytes
0023	40024	Speed		1	RPM	Unsigned	2Bytes
0024	40025	Battery Voltage		0.1	V	Unsigned	2Bytes
0025	40026	D+ Voltage		0.1	V	Unsigned	2Bytes
0026	40027	Active Power		1	kW	Signed	2Bytes
0027	40028	Reactive Power		1	kvar	Signed	2Bytes
0028	40029	Apparent Power		1	kVA	Signed	2Bytes
0029	40030	Power Factor		0.01		Signed	2Bytes
0030	40031	Maintenance Countdown h		1	Hour	Unsigned	2Bytes
0031	40032	Maintenance Countdown m	0~59	1	Min.	Unsigned	2Bytes
0032	40033	Reserved					2Bytes
0033	40034	Reserved					2Bytes
0034	40035	Controller Running Status		No.		Genset Running Status	2Bytes

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0035	40036	Delay			s	Unsigned	2Bytes
0036	40037	Auto Running Status: 0-Start 1-Stop 2-No Delay				Remote Start Status	2Bytes
0037	40038	Delay			s	Unsigned	2Bytes
0038	40039	ATS Running Status: 0-No Delay 1-Transfer Rest				Unsigned	2Bytes
0039	40040	Delay			s	Unsigned	2Bytes
0040	40041	Mains Status: 0-Normal 1-Abnormal 2-No Delay				Unsigned	2Bytes
0041	40042	Delay			s	Unsigned	2Bytes
0042	40043	Engine Accumulated Running Time (h) MSB		1	Hour	Unsigned	2Bytes
0043	40044	Engine Accumulated Running Time (h) LSB		1	Hour	Unsigned	2Bytes
0044	40045	Engine Accumulated Running Time (min)	0~59	1	Min.	Unsigned	2Bytes
0045	40046	Engine Accumulated Running Time (sec)	0~59	1	Sec.	Unsigned	2Bytes
0046	40047	Accumulated Start Times MSB				Unsigned	2Bytes
0047	40048	Accumulated Start Times LSB				Unsigned	2Bytes
0048	40049	Accumulated Electric Energy MSB		1	kWh	Unsigned	2Bytes
0049	40050	Accumulated Electric Energy LSB		1	kWh	Unsigned	2Bytes
0050	40051	Software Version		0.1		Unsigned	2Bytes
0051	40052	Hardware Version		0.1		Unsigned	2Bytes
0052	40053	Phase A Active Power		1	kW	Signed	2Bytes
0053	40054	Phase B Active Power		1	kW	Signed	2Bytes
0054	40055	Phase C Active Power		1	kW	Signed	2Bytes
0055	40056	Output Load Percentage		1	%	Unsigned	2Bytes
0056	40057	Reserved					2Bytes
0057	40058	Reserved					2Bytes
0058	40059	Coolant Level		1	%	Signed	Only support ECU unit
0059	40060	Oil Temp.		1	°C	Signed	
0060	40061	Coolant Pressure		1	kPa	Signed	
0061	40062	Fuel Pressure		1	kPa	Signed	
0062	40063	Fuel Temp.		1	°C	Signed	
0063	40064	Air Inlet Temp.		1	°C	Signed	
0064	40065	Exhaust Outlet Temp.		1	°C	Signed	

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0065	40066	Turbo Pressure		1	kPa	Signed	
0066	40067	Fuel Consumption		0.1	L/h	Signed	
0067	40068	Reserved					2Bytes
0068	40069	Total Fuel Consumption		1	L	Signed	Only support ECU Unit
0069	40070						
0070	40071	SCM Internal Temp.		0.1	°C	Signed	2Bytes
0071	40072	Controller Model				Unsigned	2Bytes
0072	40073	Controller Date: Year	0~99	1		Unsigned	2Bytes
0073	40074	Controller Date: Month	1~12	1		Unsigned	2Bytes
0074	40075	Controller Date: Day	1~31	1		Unsigned	2Bytes
0075	40076	Controller Date: Week	0~6	1		Unsigned	2Bytes
0076	40077	Controller Time: Hour	0~23	1		Unsigned	2Bytes
0077	40078	Controller Time: Min.	0~59	1		Unsigned	2Bytes
0078	40079	Controller Time: Sec.	0~59	1		Unsigned	2Bytes
0079	40080	Release Year	0~99	1		Unsigned	2Bytes
0080	40081	Release Month	1~12	1		Unsigned	2Bytes
0081	40082	Released Day	1~31	1		Unsigned	2Bytes
0082	40083	LCD Temp.		1	°C	Signed	2Bytes
0083	40084	LCD Heating Percentage		1	%	Unsigned	2Bytes
0084	40085	ECU Temp.		1	°C	Signed	Only support ECU unit
0085	40086	Ambient Pressure		1	kPa	Signed	
0086	40087	ECU Running Time				Signed	
0087	40088						
0088	40089	MTU FC		1		Unsigned	
0089	40090	MTU Droop		0.1		Unsigned	
0090	40091	MTU Demand Source				Unsigned	
0091	40092	MTU SSD				Unsigned	
0092	40093	Gen. UA Phase		1	°	Signed	2Bytes
0093	40094	Gen. UB Phase		1	°	Signed	2Bytes
0094	40095	Gen. UC Phase		1	°	Signed	2Bytes
0095	40096	Mains UA Phase		1	°	Signed	2Bytes
0096	40097	Mains UB Phase		1	°	Signed	2Bytes
0097	40098	Mains UC Phase		1	°	Signed	2Bytes
0098 -0127	40099 -40128	DM1 Alarm					
0128 -0157	40129 -40158	DM2 Alarm					
0158	40159	ECU Shutdown Times				Unsigned	2Bytes
0159	40160	ECU Warning Times				Unsigned	2Bytes
0160	40161	MCU ID H1				Unsigned	4Bytes
0161	40162						

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
0162	40163	MCU ID H2				Unsigned	4Bytes
0163	40164						
0164	40165	MCU ID L				Unsigned	4Bytes
0165	40166						
0166	40167	Ambient Temp.		1	°C	Signed	2Bytes
0167	40168	Urea Level		0.1	%	Unsigned	2Bytes
0168	40169	Urea Temp.		1	°C	Signed	2Bytes
0169	40170	Reserved				Unsigned	2Bytes
0170	40171	DPF Regeneration Reminder				DPF Regeneration Reminder	2Bytes
0171	40172	DPF Regeneration Inhibit				Regeneration Inhibit	2Bytes
0172	40173	Driver Alarm				Driver Alarm	2Bytes
0173	40174	DPF Regeneration Status Indication				Regeneration Status	2Bytes
0174	40175	DPF Status Indication				DPF Status	2Bytes
0175	40176	DPF Carbon Deposit				DPF Carbon Deposit	2Bytes
0176	40177	Phase A Current		0.1	A	Unsigned	4Bytes
0177	40178						
0178	40179	Phase B Current		0.1	A	Unsigned	4Bytes
0179	40180						
0180	40181	Phase C Current		0.1	A	Unsigned	4Bytes
0181	40182						
0182	40183	Active Power		0.1	kW	Signed	4Bytes
0183	40184						
0184	40185	Reactive Power		0.1	kvar	Signed	4Bytes
0185	40186						
0186	40187	Apparent Power		0.1	kVA	Signed	4Bytes
0187	40188						
Other Addresses of HGM6100Z							
2500	42501	Phase A Current		0.1	A	Unsigned	4Bytes
2501	42502						
2502	42503	Phase B Current		0.1	A	Unsigned	4Bytes
2503	42504						
2504	42505	Phase C Current		0.1	A	Unsigned	4Bytes
2505	42506						
2506	42507	Active Power		0.1	kW	Signed	4Bytes
2507	42508						
2508	42509	Reactive Power		0.1	kvar	Signed	4Bytes
2509	42510						
2510	42511	Apparent Power		0.1	kVA	Signed	4Bytes

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remark
2511	42512						

NOTE 1: Actual value = data received * ratio. Take the Frequency as the example: if the data received is 5000 (1388H), ratio is 0.01Hz, then the actual frequency value is 50.00Hz (5000*0.01Hz).

NOTE 2: If the data has 4 bytes, the actual value = high order bits of data received * 65536 + low order bits of data received.

NOTE 3: Analysis for Accumulated Data (Accumulated Running Time, Start Times, Electric Energy)

Take the Accumulated Running Time (h) as an example: if the MSB of data received is 0x01, and the LSB is 0x04, then the actual running time value is 10004h (1*10000+4=10004).

NOTE 4: If data received is 32766, it means there is no normal data, and "###" will be shown.

NOTE 5: Definition of signed number: Take the data received "8000H" as the example, convert it to binary number "1000 0000 0000 0000b". The MSB is 1, which means it is negative. The number minus 1 will get its 1's complement, then inverting it will get the absolute value of the negative number. Finally convert the absolute value to decimal number -32768.

Example:

If "Battery Voltage" and "D+ Voltage" need to be read, check the table above and find its address is 0024 and 0025, so it needs to read two data addresses.

Assuming the slave (controller) address is 01, the master or host (could be PC) request command is as following:

Table 7 Master (PC) Request Command

Slave Address	Function Code	Start Address (0024)		Request Data Qty. (2)		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**03**	**00**	**18**	**00**	**02**	**44**	**0C**

The slave response is as following:

Table 8 Slave (Controller) Response Command

Slave Address	Function Code	Data Length (Bytes)	Data				CRC 16	
			Data of Address 0024 MSB	Data of Address 0024 LSB	Data of Address 0025 MSB	Data of Address 0025 LSB	LSB	MSB
01	**03**	**04**	**01**	**12**	**00**	**00**	**5B**	**CA**

Table 9 Data Analysis

Address	Data Received (Hex)	Convert to Decimal	Meaning
0024	0112H	274	The ratio is 0.1, so the battery voltage is 27.4V
0025	0000H	0	The ratio is 0.1, so the D+ voltage is 0V

3.3 FUNCTION CODE 05H MAPPING REMOTE COIL FIELD

Table 10 Remote Coil Field

Modbus Address	PLC Address	Item	Description	
0000	0001	Engine in Remote Start Status	Active only when sending 00FFH or FF00H	
0001	0002	Engine in Remote Stop Status	Active only when sending 00FFH or FF00H	
0003	0004	Engine in Remote Auto Status	Active only when sending 00FFH or FF00H	
0004	0005	Engine in Remote Manual Status	Active only when sending 00FFH or FF00H	
0005	0006	Remote Gen. Close/Open	Active only when sending 00FFH or FF00H	HGM6120Z
0006	0007	Remote Mains Close/Open	Active only when sending 00FFH or FF00H	
0005	0006	Remote Gen. Open	Active only when sending 00FFH or FF00H	HGM6110Z
0006	0007	Remote Gen. Close	Active only when sending 00FFH or FF00H	

NOTE: The remote command in the table above only needs to be sent once.

Example:

If the remote controller is in auto mode, check the table first and find its remote address is 0003.

Assuming the slave address is 01, the master request command is as following:

Table 11 Master Request Command

Slave Address	Function Code	Remote Address (0003)		Remote Data		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**05**	**00**	**03**	**FF**	**00**	**7C**	**3A**

The slave response is as following:

Table 12 Slave Response Command

Slave Address	Function Code	Remote Address (0003)		Remote Data		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**05**	**00**	**03**	**FF**	**00**	**7C**	**3A**

Whether the remote command is active can be checked by sending function code 01H to read the status of address 0041.

3.4 GENSET RUNNING STATUS

Table 13 Genset Running Status

No.	Content	Description
0	Standby	No delay value in the status
1	Preheat	
2	Fuel Output	
3	Crank	
4	Crank Rest	
5	Safety on Delay	
6	Start Idle	
7	High Speed Warming up	
8	Wait for On-load	No delay value in the status
9	Normal Running	No delay value in the status
10	Cooling	
11	Stop Idle	
12	ETS	
13	Wait for Stop	
14	Stop Failure	No delay value in the status
15	After Stop	

3.5 REMOTE START STATUS

Table 14 Remote Start Status

Value (No.)	Content	Description
0	No Delay	No delay value in the status
1	Start Delay	
2	Stop Delay	

3.6 DPF REGENERATION REMINDER

Table 15 DPF Regeneration Reminder

Value (No.)	Content	Description
0	No icon displayed	
1	Icon remains on	
2	Icon flashes slowly	
3	Icon flashes rapidly	

3.7 REGENERATION INHIBIT

Table 16 Regeneration Inhibit

Value (No.)	Content	Description
0	No icon displayed	
1	Icon remains on	

3.8 DRIVER ALARM

Table 17 Driver Alarm

Value (No.)	Content	Description
0	No icon displayed	
1	Reserved	
2	Reserved	
3	Reserved	
4	Reserved	
5	Icon remains on	Driver Alarm/Severe limit will be activated soon
6	Icon flashes	
7	Alarm exists, but no icon displayed	

3.9 REGENERATION STATUS

Table 18 Regeneration Status

Value (No.)	Content	Description
0	No icon displayed	
1	Icon remains on	

3.10 DPF STATUS

Table 19 DPF Status

Value (No.)	Content	Description
0	No icon displayed	
1	Icon remains on	
2	Icon flashes slowly	
3	Icon flashes rapidly	

3.11 DPF CARBON DEPOSIT

Table 20 DPF Carbon Deposit

Value (No.)	Content	Description
0~8	No icon displayed	
9~10	Icon flashes	
11 and above	Icon remains on	

SmartGen

3.12 COMMUNICATION PARAMETER VIEWING AND CONFIGURATION

1) Press the ⚙/OK key, enter the correct password (**Default: 0318**) to get into the parameter setting menu;

2) Select "Module Address" via the ▼ key;

3) Press the ⚙/OK key again, the parameter will be in the selected status

4) Set the current selected parameter via ▲ and ▼ keys, then press the ⚙/OK key to confirm and end the editing, then the selected status will disappear;

5) Press the ⌂/↰ key to return the home page.

NOTE: The configuration takes effect once the parameter setting is completed.

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4 FAQ

4.1 GROUNDING OF THE CABLE SHIELD

To prevent the coupling of interference on the cable, one end of the cable shield should be grounded.

4.2 TERMINATION RESISTOR

At both ends of the linear network (between the two communication ports furthest apart), two 120-ohm termination resistors need to be installed in parallel. According to the signal transmission theory, the termination resistor can avoid the signal reflections and improve the signal integrity effectively. The value of two termination resistor in parallel is basically equal to the characteristic impedance of the transmission cable.

A standard RS-485 network will usually use the termination resistor. The resistor can be avoided while the cable is too short, or it is a temporary or lab test.

4.3 RS485 TO USB CONVERTER

It can communicate with PC via the SmartGen SG72A converter.

4.4 EXTEND TRANSMISSION DISTANCE

Adding two SmartGen SGCAN300 Repeaters can extend the communication distance to at most 10 kilometers.

Figure 3 SGCAN300 Application Diagram

4.5 SOLUTIONS FOR COMMUNICATION FAILURE

1) Check whether the positive and negative of RS485 is connected correctly;
2) Check whether the communication parameters setting is correct;
3) Check the RS485 converter (if any) is normal;
4) Check whether the termination resistors are connected correctly;
5) Disconnect the RS485 cables to the controller, test the voltage difference of RS485 Terminal A and B on the controller, if the result is between -200mV and +200mV, it means the communication port is abnormal;
6) It is recommended to download third-party communication test software to verify whether the communication is normal, such as modscan32, modbus poll, etc.

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