SmartGen

MAKING CONTROL SMARTER

HAT600PT

ATS CONTROLLER

COMMUNICATION PROTOCOL

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SmartGen

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Table 1 Software Version

Date	Version	Content
2024-04-26	V1.0	Original release.

1 DESCRIPTION

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

The module works as a slave module, and uses Modbus-RTU protocol, but it doesn't support other protocols, such as Modbus-ASCII, etc.

Communication address: 1~254 (Default: 1)
Baud rate: 2400/4800/9600/19200bps (Default: 9600bps)
Start bit: 1 bit
Data bit: 8 bits
Parity bit: no parity, odd parity and even parity (Default: no parity)
Stop bit: 1 bit or 2 bits (Default: 2 bits)

Function code supported: 03H, 05H. Function code 03H is used for reading controller's alarms, status and various kinds of electric parameters; Function code 05H is used for sending remote command.

Data 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 transmission distance can reach up to 1,000 meters.

A maximum of 120 registers can be read per request.

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

2 WIRING DIAGRAM

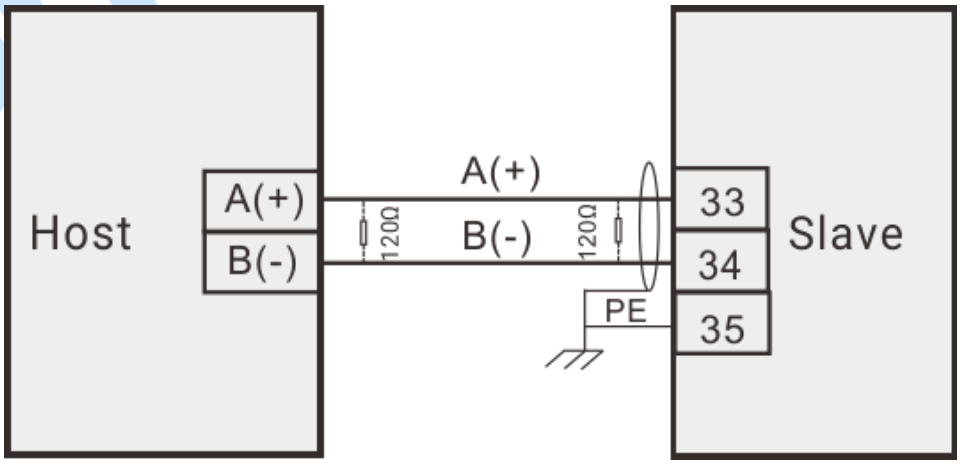

Fig. 1 RS485 Communication Wiring Diagram

3 CONTROLLER INTERNAL REGISTER ADDRESS AND DATA

In the table below, S1 refers to the first power supply, S2 refers to the second power supply, and the slash mark (“/”) means the address is reserved.

3.1 FUNCTION CODE 03H MAPPING ALARM AND COIL STATUS OF DATA FIELD

Table 2 Alarm and Coil Status of Data Field

Modbus Address	PLC Address	Item	Description
500.0	40501.0	Common Alarm	“0” means there is no common alarm “1” means there are common alarms (500.0 means the Boolean value of bit 0 at address 500) The content listed below follows the same rule
500.1	40501.1	Common Warning	
500.2	40501.2	Common Fault Alarm	
500.3	40501.3	/	
500.4	40501.4	/	
500.5	40501.5	/	
500.6	40501.6	Audible Alarm	
500.7	40501.7	/	
500.8	40501.8	Auto Mode	0: Manual Mode 1: Auto Mode
500.9	40501.9	Local Mode	
500.10	40501.1	S1 Master	S1 means the first power supply “1” means S1 works as the master power supply “0” means S1 works as the standby power supply
500.11	40501.11	S2 Master	S2 means the second power supply “1” means S12 works as the master power supply “0” means S2 works as the standby power supply
500.12	40501.12	/	
500.13	40501.13	/	
500.14	40501.14	/	
500.15	40501.15	Genset Start Output	“0” means genset start signal doesn't output “1” means genset start signal has output
501.0	40502.0	S1 Voltage Normal	
501.1	40502.1	S1 Voltage Abnormal	
501.2	40502.2	S1 Transient Voltage Abnormal	

Modbus Address	PLC Address	Item	Description
501.3	40502.3	S1 Transient Voltage Normal	
501.4	40502.4	/	
501.5	40502.5	/	
501.6	40502.6	/	
501.7	40502.7	S1 Genset Start Output	
501.8	40502.8	S1 Blackout	
501.9	40502.9	S1 Overvoltage	
501.10	40502.1	S1 Undervoltage	
501.11	40502.11	S1 Overfrequency	
501.12	40502.12	S1 Underfrequency	
501.13	40502.13	S1 Loss of Phase	
501.14	40502.14	S1 Reverse Phase Sequence	
501.15	40502.15	/	
502.0	40503.0	S2 Voltage Normal	
502.1	40503.1	S2 Voltage Abnormal	
502.2	40503.2	S2 Transient Voltage Abnormal	
502.3	40503.3	S2 Transient Voltage Normal	
502.4	40503.4	/	
502.5	40503.5	/	
502.6	40503.6	/	
502.7	40503.7	S2 Genset Start Output	
502.8	40503.8	S2 Blackout	
502.9	40503.9	S2 Overvoltage	
502.10	40503.1	S2 Undervoltage	
502.11	40503.11	S2 Overfrequency	
502.12	40503.12	S2 Underfrequency	
502.13	40503.13	S2 Loss of Phase	
502.14	40503.14	S2 Reverse Phase Sequence	
502.15	40503.15	/	
503.0	40504.0	Switch Transfer Fault	
503.1	40504.1	S1 Close Failure	
503.2	40504.2	S1 Open Failure	
503.3	40504.3	/	
503.4	40504.4	S2 Close Failure	
503.5	40504.5	S2 Open Failure	
503.6	40504.6	/	
503.7	40504.7	/	
503.8	40504.8	/	

Modbus Address	PLC Address	Item	Description
503.9	40504.9	/	
503.10	40504.1	Forced Open Fault	
503.11	40504.11	S1 Genset Fault	
503.12	40504.12	S2 Genset Fault	
503.13	40504.13	Switch Trip Fault	
503.14	40504.14	/	
503.15	40504.15	S1/S2 Close At The Same Time Fault	
504.0	40505.0	/	
504.1	40505.1	/	
504.2	40505.2	Forced Open Warning	
504.3	40505.3	Battery Undervoltage Warning	
504.4	40505.4	Battery Overvoltage Warning	
504.5	40505.5	/	
504.6	40505.6	/	
504.7	40505.7	/	
504.8	40505.8	Switch Output Voltage Abnormal Fault	
504.9	40505.9	S1 Switch Trip Alarm	
504.10	40505.1	S2 Switch Trip Alarm	
504.11	40505.11	/	
504.12	40505.12	/	
504.13	40505.13	/	
504.14	40505.14	Busbar Voltage Abnormal	
504.15	40505.15	Switch Output Voltage Abnormal Warning	
505.0	40506.0	Aux. Input 1 Status	“0” means there is no signal input. “1” means there is signal input.
505.1	40506.1	Aux. Input 2 Status	Follow the same rule of “Aux. Input 1 Status”
505.2	40506.2	Aux. Input 3 Status	
505.3	40506.3	Aux. Input 4 Status	
505.4	40506.4	/	
505.5	40506.5	/	
505.6	40506.6	/	
505.7	40506.7	/	
505.8	40506.8	/	
505.9	40506.9	/	
505.10	40506.1	/	
505.11	40506.11	/	
505.12	40506.12	/	
505.13	40506.13	/	

Modbus Address	PLC Address	Item	Description
505.14	40506.14	/	
505.15	40506.15	/	
506.0	40507.0	Aux. Output 1 Status	"1" means there is signal output. "0" means there is no signal output.
506.1	40507.1	Aux. Output 2 Status	Follow the same rule of "Aux. Output 1 Status"
506.2	40507.2	Aux. Output 3 Status	
506.3	40507.3	Aux. Output 4 Status	
506.4	40507.4	Aux. Output 5 Status	
506.5	40507.5	Aux. Output 6 Status	
506.6	40507.6	/	
506.7	40507.7	/	
506.8	40507.8	/	
506.9	40507.9	/	
506.10	40507.1	/	
506.11	40507.11	/	
506.12	40507.12	/	
506.13	40507.13	/	
506.14	40507.14	/	
506.15	40507.15	/	
507.0	40508.0	S1 Close Control Output	
507.1	40508.1	S1 Open Control Output	
507.2	40508.2	S2 Close Control Output	
507.3	40508.3	S2 Open Control Output	
507.4	40508.4	S1 Switch Close Status	
507.5	40508.5	S2 Switch Close Status	
507.6	40508.6	/	
507.7	40508.7	/	
507.8	40508.8	/	
507.9	40508.9	/	
507.10	40508.1	/	
507.11	40508.11	/	
507.12	40508.12	Remote Gen On-Load	
507.13	40508.13	Remote Gen Off-Load	
507.14	40508.14	Mains Abnormal Gen Start	
507.15	40508.15	Scheduled Start	
508.0	40509.0	Cycle Start	
508.1	40509.1	Balanced Running Start	
508.2	40509.2	Master-Slave Start	
508.3	40509.3	/	
508.4	40509.4	Scheduled Not Start	
508.5	40509.5	/	
508.6	40509.6	/	
508.7	40509.7	/	

Modbus Address	PLC Address	Item	Description
508.8	40509.8	/	
508.9	40509.9	/	
508.10	40509.1	Start Inhibit	
508.11	40509.11	/	
508.12	40509.12	S1 Close Inhibit	
508.13	40509.13	S2 Close Inhibit	
508.14	40509.14	/	
508.15	40509.15	/	
509.0	40510.0	/	
509.1	40510.1	/	
509.2	40510.2	/	
509.3	40510.3	/	
509.4	40510.4	/	
509.5	40510.5	Elevator Control	
509.6	40510.6	Fire Control Linkage Output	
509.7	40510.7	/	
509.8	40510.8	/	
509.9	40510.9	/	
509.10	40510.1	/	
509.11	40510.11	Auto Trans./Auto Restore Digital Input	
509.12	40510.12	Remote Control Inhibit Digital Input	
509.13	40510.13	/	
509.14	40510.14	/	
509.15	40510.15	/	
510.0	40511.0	/	
510.1	40511.1	/	
510.2	40511.2	/	
510.3	40511.3	/	
510.4	40511.4	/	
510.5	40511.5	/	
510.6	40511.6	/	
510.7	40511.7	/	
510.8	40511.8	/	
510.9	40511.9	/	
510.10	40511.10	/	
510.11	40511.11	/	
510.12	40511.12	/	
510.13	40511.13	/	
510.14	40511.14	/	
510.15	40511.15	/	

EXAMPLE:

If “Aux. Input 1 Status” and “Aux. Output 1 Status” need to be read, check the table above and find their Modbus addresses are 505.0 and 506.0, 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 3 Master (PC) Request Frame

Slave Address	Function Code	Start Address (505)		Request Data Length (2)		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**03**	**01**	**F9**	**00**	**02**	**15**	**C6**

The slave response is as following:

Table 4 Slave (Controller) Response Frame

Slave Address	Function Code	Data Length (Bytes)	Data				CRC 16	
			Data of Address 505 MSB	Data of Address 505 LSB	Data of Address 506 MSB	Data of Address 506 LSB	LSB	MSB
01	**03**	**04**	**00**	**01**	**00**	**20**	**AA**	**2B**

Table 5 Data Analysis

Address	Data Received (Hex)	Convert to Binary	Meaning
505	0001H	0000 0000 0000 0001 (Mapping to 505.15, 505.14, ..., 505.1, 505.0 respectively)	Data of Bit 0 is 1, which means the Aux. Input 1 is active.
506	0020H	0000 0000 0010 0000 (Mapping to 506.15, 506.14, ..., 506.1, 506.0 respectively)	Data of Bit 506.5 is 1, which means the Aux. Output 6 is active.

3.2 FUNCTION CODE 03H MAPPING PARAMETERS OF DATA FIELD

Table 6 Parameters of Data Field

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1000	41001	UAB1 (S1 Line A-B Voltage)	0~65000	1	V	16-bit Unsigned	
1001	41002	UBC1 (S1 Line B-C Voltage)	0~65000	1	V	16-bit Unsigned	
1002	41003	UCA1 (S1 Line C-A Voltage)	0~65000	1	V	16-bit Unsigned	
1003	41004	UA1 (S1 Phase A Voltage)	0~65000	1	V	16-bit Unsigned	
1004	41005	UB1 (S1 Phase B Voltage)	0~65000	1	V	16-bit Unsigned	
1005	41006	UC1 (S1 Phase C Voltage)	0~65000	1	V	16-bit Unsigned	
1006	41007	UA1 Phase (S1 Phase A Angle)	0~360.0	0.1	°	16-bit Signed	NOTE 3
1007	41008	UB1 Phase (S1 Phase B Angle)	0~360.0	0.1	°	16-bit Signed	
1008	41009	UC1 Phase (S1 Phase C Angle)	0~360.0	0.1	°	16-bit Signed	
1009	41010	Frequency 1 (S1 Frequency)	0~100.00	0.01	Hz	16-bit Signed	
1010	41011	Battery Voltage	0~100.0	0.1	V	16-bit Unsigned	
1011	41012	/					
1012	41013	/					
1013	41014	/					
1014	41015	/					
1015	41016	/					
1016	41017	/					
1017	41018	/					
1018	41019	/					
1019	41020	/					
1020	41021	UAB2 (S2 Line A-B Voltage)	0~65000	1	V	16-bit Unsigned	

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1021	41022	UBC2 (S2 Line B-C Voltage)	0~65000	1	V	16-bit Unsigned	
1022	41023	UCA2 (S2 Line C-A Voltage)	0~65000	1	V	16-bit Unsigned	
1023	41024	UA2 (S2 Phase A Voltage)	0~65000	1	V	16-bit Unsigned	
1024	41025	UB2 (S2 Phase B Voltage)	0~65000	1	V	16-bit Unsigned	
1025	41026	UC2 (S2 Phase C Voltage)	0~65000	1	V	16-bit Unsigned	
1026	41027	UA2 Phase (S2 Phase A Angle)	0~360.0	0.1	°	16-bit Signed	NOTE 3
1027	41028	UB2 Phase (S2 Phase B Angle)	0~360.0	0.1	°	16-bit Signed	
1028	41029	UC2 Phase (S2 Phase C Angle)	0~360.0	0.1	°	16-bit Signed	
1029	41030	Frequency 2 (S2 Frequency)	0~100.00	0.01	Hz	16-bit Signed	
1030	41031	/					
1031	41032	/					
1032	41033	/					
1033	41034	/					
1034	41035	/					
1035	41036	/					
1036	41037	/					
1037	41038	/					
1038	41039	/					
1039	41040	/					
1040	41041	/					
1041	41042	/					
1042	41043	/					
1043	41044	/					
1044	41045	/					
1045	41046	/					
1046	41047	/					
1047	41048	/					
1048	41049	/					
1049	41050	/					

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1050	41051	/					
1051	41052	/					
1052	41053	/					
1053	41054	/					
1054	41055	/					
1055	41056	/					
1056	41057	/					
1057	41058	/					
1058	41059	/					
1059	41060	/					
1060	41061	/					
1061	41062	/					
1062	41063	/					
1063	41064	/					
1064	41065	/					
1065	41066	/					
1066	41067	/					
1067	41068	/					
1068	41069	/					
1069	41070	/					
1070	41071	/					
1071	41072	/					
1072	41073	/					
1073	41074	/					
1074	41075	/					
1075	41076	/					
1076	41077	/					
1077	41078	/					
1078	41079	/					
1079	41080	/					
1080	41081	/					
1081	41082	/					
1082	41083	/					
1083	41084	/					
1084	41085	/					
1085	41086	/					
1086	41087	/					
1087	41088	/					
1088	41089	S1 Power Status	0~65535	No.		16-bit Unsigned	See details in S1 Power Supply Status
1089	41090	S1 Power Status Delay	0~65535	1	s	16-bit Unsigned	

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1090	41091	S2 Power Status	0~65535	No.		16-bit Unsigned	See details in S2 Power Supply Staus
1091	41092	S2 Power Status Delay	0~65535	1	s	16-bit Unsigned	
1092	41093	Genset Running Status	0~65535	No.		16-bit Unsigned	See details in Genset Running Status
1093	41094	Genset Running Status Delay	0~65535	1	s	16-bit Unsigned	
1094	41095	ATS Status	0~65535	No.		16-bit Unsigned	See details in ATS Status
1095	41096	ATS Status Delay	0~65535	1	s	16-bit Unsigned	
1096	41097	/					
1097	41098	Mutual Backup Active	0~65535			16-bit Unsigned	NOTE 4
1098	41099	/					
1099	41100	Auto Transfer/Auto Restore Setting	0~65535			16-bit Unsigned	NOTE 4
1100	41101	Controller Date: Year	0~100	1	Year	16-bit Unsigned	
1101	41102	Controller Date: Month	1~12	1	Month	16-bit Unsigned	
1102	41103	Controller Date: Day	1~31	1	Day	16-bit Unsigned	
1103	41104	Controller Date: Week	0~6	/		16-bit Unsigned	0: Sunday 1~6: Monday to Saturday
1104	41105	Controller Time: Hour	0~23	1	Hour	16-bit Unsigned	
1105	41106	Controller Time: Minute	0~59	1	Min	16-bit Unsigned	
1106	41107	Controller Time: Second	0~59	1	Sec	16-bit Unsigned	
1107	41108	S1 PF Delay	0~65535	1	Sec	16-bit Unsigned	
1108	41109	S2 PF Delay	0~65535	1	Sec	16-bit Unsigned	
1109	41110	/					
1110	41111	/					
1111	41112	Continuous Powered Time: Hour	0~65535	1	Hour	16-bit Unsigned	

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1112	41113	Continuous Powered Time: Minute	0~59	1	Min	16-bit Unsigned	
1113	41114	Continuous Powered Time: Second	0~59	1	Sec	16-bit Unsigned	
1114	41115	Last Continuous Powered Time: Hour	0~65535	1	Hour	16-bit Unsigned	
1115	41116	Last Continuous Powered Time: Minute	0~59	1	Min	16-bit Unsigned	
1116	41117	Last Continuous Powered Time: Second	0~59	1	Sec	16-bit Unsigned	
1117	41118	S1 Total Powered Time: Hour (LSB)	0~4294967296	1	Hour	32-bit Unsigned	NOTE 2
1118	41119	S1 Total Powered Time: Hour (MSB)					
1119	41120	S1 Total Powered Time: Minute	0~59	1	Min	16-bit Unsigned	
1120	41121	S1 Total Powered Time: Second	0~59	1	Sec	16-bit Unsigned	
1121	41122	S2 Total Powered Time: Hour (LSB)	0~4294967296	1	Hour	32-bit Unsigned	NOTE 2
1122	41123	S2 Total Powered Time: Hour (MSB)					
1123	41124	S2 Total Powered Time: Minute	0~59	1	Min	16-bit Unsigned	
1124	41125	S2 Total Powered Time: Second	0~59	1	Sec	16-bit Unsigned	
1125	41126	/					
1126	41127	/					
1127	41128	/					
1128	41129	/					
1129	41130	S1 Total Close Times (LSB)	0~4294967296	1	Time	32-bit Unsigned	NOTE 2
1130	41131	S1 Total Close Times (MSB)					
1131	41132	/					
1132	41133	/					
1133	41134	/					
1134	41135	/					
1135	41136	S2 Total Close	0~429496	1	Time	32-bit	NOTE 2

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
		Times (LSB)	7296			Unsigned	
1136	41137	S2 Total Close Times (MSB)					
1137	41138	/					
1138	41139	/					
1139	41140	/					
1140-1149	41141-41150	UA1 Harmonic Ratio (3-21 Odd Times)	0-65000	0.1	%	16-bit Unsigned	
1150-1159	41151-41160	UB1 Harmonic Ratio (3-21 Odd Times)	0-65000	0.1	%	16-bit Unsigned	
1160-1169	41161-41170	UC1 Harmonic Ratio (3-21 Odd Times)	0-65000	0.1	%	16-bit Unsigned	
1170-1179	41171-41180	UA2 Harmonic Ratio (3-21 Odd Times)	0-65535	0.1	%	16-bit Unsigned	
1180-1189	41181-41190	UB2 Harmonic Ratio (3-21 Odd Times)	0-65535	0.1	%	16-bit Unsigned	
1190-1199	41191-41200	UC2 Harmonic Ratio (3-21 Odd Times)	0-65535	0.1	%	16-bit Unsigned	
1200-1209	41201-41210	/					
1210-1219	41211-41220	/					
1220-1229	41221-41230	/					
1230	41231	UA1 THD	0-65535	0.1	%	16-bit Unsigned	
1231	41232	UB1 THD	0-65535	0.1	%	16-bit Unsigned	
1232	41233	UC1 THD	0-65000	0.1	%	16-bit Unsigned	
1233	41234	UA2 THD	0-65535	0.1	%	16-bit Unsigned	
1234	41235	UB2 THD	0-65535	0.1	%	16-bit Unsigned	
1235	41236	UC2 THD	0-65535	0.1	%	16-bit Unsigned	
1236	41237	/					
1237	41238	/					
1238	41239	/					
1239	41240	/					
1240	41241	/					
1241	41242	/					
1242	41243	/					

Modbus Address	PLC Address	Item	Range (Decimal)	Ratio	Unit	Description	Remarks
1243	41244	/					
1244	41245	/					
1245	41246	/					
1246	41247	/					
1247	41248	/					
1248	41249	/					

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 there are 4 bytes in the data, the actual value = high order bits of data received * 65536 + low order bits of data received.

NOTE 3：If data received is 32766, it means there is no normal data, and "###" will be shown.

NOTE 4：It is the same as the Auto Transfer/Auto Restore and Mutual Backup in parameters setting.

EXAMPLE:

If "S1 Total Close Times" (current value is 123456 times) needs to be read, check the table above and find its modbus address is 1129 and 1130, so it needs to read two bytes addresses.

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

Table 7 Master Request Command

Slave Address	Function Code	Start Address (1129)		Request Data Length (2)		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**03**	**04**	**69**	**00**	**02**	**15**	**27**

The slave response command is as following:

Table 8 Slave Response Command

Slave Address	Function Code	Data Length (Bytes)	Data				CRC 16	
			Data of Address 1129 MSB	Data of Address 1129 LSB	Data of Address 1130 MSB	Data of Address 1130 LSB	LSB	MSB
01	**03**	**04**	**E2**	**40**	**00**	**01**	**0C**	**5F**

Fill the data received into the address respectively, as shown in the table below:

Table 9 Data Analysis

Address	Data Received (Hex)	Data Combined (Hex)	S1 Total Close Times (Decimal)
1129	E240H	0001E240H	123456
1130	0001H		

3.3 FUNCTION CODE 05H MAPPING REMOTE COIL FIELD

Table 10 Remote Coil Field

Modbus Address	PLC Address	Item	Description
15000	15001	Remote S1 Close	Active only when sending FF00H
15001	15002	Remote S1 Open	Active only when sending FF00H
15002	15003	Remote S2 Close	Active only when sending FF00H
15003	15004	Remote S2 Open	Active only when sending FF00H
15004	15005	Auto/Manual Mode	Manual Mode: Active only when sending 0000H Auto Mode: Active only when sending FF00H
15005	15006	S1 Master Set	Active only when sending FF00H
15006	15007	S2 Master Set	Active only when sending FF00H
15007	15008	Alarm Reset	Active only when sending FF00H
15008	15009	Remote Genset Start	Active only when sending FF00H
15009	15010	Remote Genset Stop	Active only when sending FF00H
15010	15011	/	Active only when sending FF00H
15011	15012	/	Active only when sending FF00H
15012	15013	Remote Output 1	Active only when sending FF00H
15013	15014	Remote Output 2	Active only when sending FF00H
15014	15015	Remote Output 3	Active only when sending FF00H
15015	15016	Remote Output 4	Active only when sending FF00H
15016	15017	Remote Output 5	Active only when sending FF00H
15017	15018	Remote Output 6	Active only when sending 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 15004. Assuming the slave address is 01, the master request command is as following:

Table 11 Master Request Command

Slave Address	Function Code	Remote Address (15004)		Remote Data		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**05**	**3A**	**9C**	**FF**	**00**	**40**	**CC**

The slave response command is as following:

Table 12 Slave Response Command

Slave Address	Function Code	Remote Address (15004)		Remote Data		CRC 16	
		MSB	LSB	MSB	LSB	LSB	MSB
01	**05**	**3A**	**9C**	**FF**	**00**	**40**	**CC**

Whether the remote command is active and executed can be checked by sending function code 03H to read auto mode status of address 500.8.

3.4 S1 POWER SUPPLY STATUS

Table 13 S1 Power Supply Status

Value (No.)	Item	Delay
0	S1 Available	There is delay in the status, Unit: Second
1	S1 Unavailable	There is delay in the status, Unit: Second
2	S1 Voltage Normal	No Delay
3	S1 Blackout	No Delay
4	S1 Overvoltage	No Delay
5	S1 Undervoltage	No Delay
6	S1 Overfrequency	No Delay
7	S1 Underfrequency	No Delay
8	S1 Loss of Phase	No Delay
9	S1 Reverse Phase Sequence	No Delay

EXAMPLE:

If the value of address 1088 is 1, the value of address 1089 is 5, that means the delay of S1 Unavailable is underway, and its countdown is 5s.

If the value of address 1088 is 4, that means the voltage of S1 is over the set value.

3.5 S2 POWER SUPPLY STATUS

Table 14 S2 Power Supply Status

Value (No.)	Status	Delay
0	S2 Available	There is delay in the status, Unit: Second
1	S2 Unavailable	There is delay in the status, Unit: Second
2	S2 Voltage Normal	No Delay
3	S2 Blackout	No Delay
4	S2 Overvoltage	No Delay
5	S2 Undervoltage	No Delay
6	S2 Overfrequency	No Delay
7	S2 Underfrequency	No Delay
8	S2 Loss of Phase	No Delay
9	S2 Reverse Phase Sequence	No Delay

3.6 GENSET RUNNING STATUS

Table 15 Genset Running Status

Value (No.)	Status	Delay
0	Start Delay	There is delay in the status, Unit: Second
1	Stop Delay	There is delay in the status, Unit: Second
2	Scheduled Not Start	There is delay in the status, Unit: Second
3	Scheduled Start	There is delay in the status, Unit: Second
4	S1 Cycle Start	There is delay in the status, Unit: Second
5	S2 Cycle Start	There is delay in the status, Unit: Second
6	S1 Genset Start	No Delay
7	S2 Genset Start	No Delay
8	Genset Start	No Delay
9	Genset Standby	No Delay
10	Battery Charging Time	Five minutes to count down, Unit: Second

EXAMPLE:

If the value of address 1092 is 1, the value of address 1093 is 50, that means the genset is going to stop, and its countdown is 50s.

If the value of address 1092 is 6, that means the genset of S1 has already started.

3.7 ATS STATUS

Table 16 ATS Status

Value (No.)	Status	Delay
0	Ready to Transfer	No Delay
1	S1 Closing	There is delay in the status, Unit: Second
2	S1 Opening	There is delay in the status, Unit: Second
3	S2 Closing	There is delay in the status, Unit: Second
4	S2 Opening	There is delay in the status, Unit: Second
5	Transfer Interval	There is delay in the status, Unit: Second
6	S1 Re-close	There is delay in the status, Unit: Second
7	S1 Re-open	There is delay in the status, Unit:

Value (No.)	Status	Delay
		Second
8	S2 Re-close	There is delay in the status, Unit: Second
9	S2 Re-open	There is delay in the status, Unit: Second
10	/	
11	/	
12	/	
13	Wait for S1 PF Input	There is delay in the status, Unit: Second
14	Wait for S2 PF Input	There is delay in the status, Unit: Second
15	Elevator Delay	There is delay in the status, Unit: Second
16	S1 On-load	No Delay
17	S2 On-load	No Delay
18	Off-load	No Delay

4 CONFIGURATION OF COMMUNICATION PARAMETERS

1) In the homepage of main screen, press the ⚙/OK key to enter the menu page;

2) Press the Down key to select the “Parameter Setting”, then press the ⚙/OK key to enter the parameters password page;

3) Enter the correct password (default: 01234), press the ⚙/OK key to get into the parameter setting menu;

4) Press the ▼/☼ key to select “Module Setting”, and press the ⚙/OK key to enter the submenu;

5) Press the ▲/🔇 key, ▼/☼ key to select “Module Address”, then press the ⚙/OK key to edit the parameter, the corresponding parameters will be selected;

6) Press and hold the ⮌/⌂ key to return the home page.

5 FAQ

5.1 GROUNDING OF THE CABLE SHIELD

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

5.2 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.

5.3 RS485 TO USB CONVERTER

It can communicate with PC via the SmartGen SG72A converter.

5.4 EXTEND TRANSMISSION DISTANCE

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

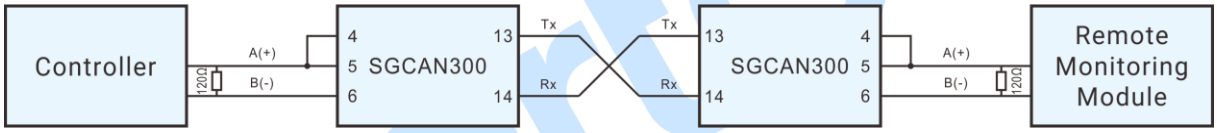

Fig. 2 SGCAN300 Application Diagram

5.5 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) 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;
5) It is recommended to download third-party communication test software to verify whether the communication is normal, such as modscan32, modbus poll, etc.