

Communication Protocol of Residential Hybrid Inverter

V1.0.25

Version number	Date	Note
1.0.12	2016/02/22	Initial released version.
1.0.13	2016/10/13	Modify content for register: 5003-5005,13036-13038,13055.
1.0.14	2017/12/05	Add register: 2582-2626 (Firmware Version).
1.0.15	2018/03/12	1.Modify register 13008-13009 data type from U32 to S32. 2.Add Appendix 1.3 fault code instructions.
1.0.16	2018/06/13	1.Add description for valid device types. 2. Add device code definition to register 5000. 3.Modify register 13061 data range from 30.0-48.0V to 32.0-48.0V.
1.0.17	2018/07/17	Delete content for register 13076- 13079 and 13081-13082.
1.0.18	2019/01/05	1.Add register 13086 (Meter Comm. Detection).

		2. Delete content for register 2582-2626.
1.0.19	2019/05/28	Add new valid device types: SH5K-30/SH3K6-30/SH4K6-30, SH3.6RS/SH5.0RS/SH6.0RS, SH5.0RT/SH6.0RT/SH8.0RT/SH10RT.
1.0.20	2020/04/07	1.Add register 4954 (ARM software version) and register 4969 (DSP software version). 2.Modify register 13087 (Export Power Limitation) to include: SH5.0RT/SH6.0RT/SH8.0RT/SH10RT. 3.Add Running in External EMS mode 0x4000 in Appendix 1.1 system state for SH5.0RT/SH6.0RT/SH8.0RT/SH10RT.
1.0.21	2020/05/08	1.Modify register 13055 to include Li-ion TAWAKI. 2.Modify register 13062 data range from 20.0-60.0°C to 20.0-70.0°C. 3.Modify register 13068 data range from 40.00-60.00V to 40.00-63.00V.

		<p>4.Modify register 13069 data range from 30.000-50.000V to 30.000-53.000V.</p> <p>5.Modify register 13080 data range from 0-20s to 1-1000s.</p>
1.0.22	2020/11/13	<p>1. Add register 5622 (Export limit min), register 5623 (Export limit max), register 5628 (BDC rated power), register 5635 (Max. Charging Current (BMS)), register 5636 (Max. Discharging Current (BMS)).</p> <p>2. Modify register 13052 Charge/discharge power data range to 0-100 times of BDC rated Power (RO register 5628) for SH5.0RT/SH6.0RT/SH8.0RT/SH10RT.</p> <p>3. Modify register 13074 Export power limitation to 10 times of Export limit min (RO register 5622) -10 times of Export limit max (RO register 5623).</p>
1.0.23	2021/12/22	<p>1.Modify notes about SH3.0RS/SH3.6RS/SH4.0RS/SH5.0RS/</p>

		SH6.0RS for register 5000,5622,5623,5628,5635,5636,13087. 2.Add new valid device types: SH3.0RS/SH4.0RS
1.0.24	2022/11/29	1. Add new valid device types: SH5.0RT-20/SH6.0RT-20/SH8.0RT-20/SH10RT-20.
1.0.25	2023/01/12	1. Add new valid device types: SH5.0RT-V112/SH6.0RT-V112/SH8.0RT-V112/SH10RT-V112. 2. Add new valid device types: SH5.0RT-V122/SH6.0RT-V122/SH8.0RT-V122/SH10RT-V122.

Valid device types:

SH3K6.SH4K6.SH5K-20.SH5K-V13

SH3K6-30.SH4K6-30.SH5K-30

SH3.0RS .SH3.6RS.SH4.0RS.SH5.0RS.SH6.0RS

SH5.0RT .SH6.0RT.SH8.0RT.SH10RT

SH5.0RT-20 .SH6.0RT-20.SH8.0RT-20.SH10RT-20

SH5.0RT-V112 .SH6.0RT-V112.SH8.0RT-V112.SH10RT-V112

SH5.0RT-V122 .SH6.0RT-V122.SH8.0RT-V122.SH10RT-V122

1.Introduction

This communication protocol, complies ModBus, applies to the communication between Sungrow grid-connected hybrid inverters (SH-inverter) and monitoring system.

2.Communication Interface

1.1 RS485

Item	Default setting
Address	Inverter: 1 – 247 settable PC: 1 – 247 settable
Broadcast	Yes
Baud rate	9600 bit/s
Check bit	Null or settable
Data bit	8
Stop bit	1
Mode	RTU
Appliance interface	RS485-2W cable connection

1.2 Ethernet (optional)

Default:

- DHCP: ON
- Port: 502

3. Address Definition

- Read-only register type supports the command code of 0x04.
- Holding register type supports the command codes of 0x03, 0x10 and 0x06.

3.1 Running information variable address definition (read-only register)

No.	Name	Address	Data type	Data range	Unit	Note
1	Protocol No.	4950 - 4951	U32			
2	Protocol ver.	4952 - 4953	U32			
3	ARM software version	4954 - 4968	U16*15			
4	DSP software version	4969 - 4983	U16*15			
5	Reserved	4984-4989				
6	SN	4990 - 4999	U16*10			UTF-8
7	Device type code	5000	U16			SH3K6 0xD06 SH4K6 0xD07 SH5K-20 0xD09

						SH5K-V13 0xD03
						SH3K6-30 0xD0A
						SH4K6-30 0xD0B
						SH5K-30 0xD0C
						SH3.0RS 0xD17
						SH3.6RS 0xD0D
						SH4.0RS 0xD18
						SH5.0RS 0xD0F
						SH6.0RS 0xD10
						SH5.0RT 0xE00
						SH6.0RT 0xE01
						SH8.0RT 0xE02
						SH10RT 0xE03
						SH5.0RT-20 0xE10
						SH6.0RT-20 0xE11
						SH8.0RT-20 0xE12
						SH10RT-20 0xE13
						SH5.0RT-V112 0xE0C
						SH6.0RT-V112 0xE0D
						SH8.0RT-V112 0xE0E
						SH10RT-V112 0xE0F
						SH5.0RT-V122 0xE08

						SH6.0RT-V122 0xE09 SH8.0RT-V122 0xE0A SH10RT-V122 0xE0B
8	Nominal output power	5001	U16		0.1kW	
9	Output type	5002	U16	0-Single phase; 1-3P4L; 2-3P3L		
10	Daily Output Energy	5003	U16		0.1kWh	Hybrid active power accumulation (Include
11	Total Output Energy	5004 - 5005	U32		0.1kWh	PV generation and battery discharge energy)
12	Reserved	5006 - 5007				
13	Inside Temperature	5008	S16		0.1°C	
14	Reserved	5009~5010				
15	MPPT 1 Voltage	5011	U16		0.1V	
16	MPPT 1 Current	5012	U16		0.1A	
17	MPPT 2 Voltage	5013	U16		0.1V	
18	MPPT 2 Current	5014	U16		0.1A	

19	Reserved	5015 - 5016				
20	Total DC power	5017 - 5018	U32		W	PV Power
21	A-B line voltage/phase A voltage	5019	U16		0.1V	Refer to Output type (address: 5002) 0: phase voltage; 1: phase voltage; 2: line voltage
22	B-C line voltage/phase B voltage	5020	U16		0.1V	Refer to Output type (address: 5002) 0: phase voltage; 1: phase voltage; 2: line voltage
23	C-A line voltage/phase voltage	5021	U16		0.1V	Refer to Output type (address: 5002) 0: phase voltage; 1: phase voltage; 2: line voltage
24	Reserved	5022~5032				
25	Reactive power	5033~5034	S32		var	
26	Power factor	5035	S16		0.001	
27	Grid frequency	5036	U16		0.1Hz	
28	Export limit min	5622	U16		10W	SH5.0RT

29	Export limit max	5623	U16		10W	SH6.0RT SH8.0RT
30	BDC rated power	5628	U16		100W	SH10.0RT SH3.0RS
31	Max. Charging Current (BMS)	5635	U16		1A	SH3.6RS SH4.0RS
32	Max. Discharging Current (BMS)	5636	U16		1A	SH5.0RS SH6.0RS SH5.0RT-20 SH6.0RT-20 SH8.0RT-20 SH10RT-20 SH5.0RT-V112 SH6.0RT-V112 SH8.0RT-V112 SH10RT-V112 SH5.0RT-V122 SH6.0RT-V122 SH8.0RT-V122 SH10RT-V122
33	PV Power of today	6100 - 6195	U16		1W	

34	Daily PV energy yields	6196 - 6226	U16		0.1KWh	
35	Monthly PV energy yields	6227 - 6238	U16		1KWh	
36	Reserved	6239 - 6249				
37	Yearly PV energy yields	6250 - 6289	U32*20		0.1kWh	
38	Direct power consumption of today from PV	6290 - 6385	U16*96		1W	
39	Daily direct energy consumption from PV	6386 - 6416	U16*31		0.1kWh	
40	Monthly direct energy consumption from PV	6417 - 6428	U16*12		0.1kWh	
41	Yearly direct energy consumption from PV	6429 - 6468	U32*20		0.1kWh	

42	Export power from PV of today	6469 - 6564	U16*96		1W	
43	Daily export energy from PV	6565 - 6595	U16*31		0.1kWh	
44	Monthly export energy from PV	6596 - 6607	U16*12		0.1kWh	
45	Yearly export energy from PV	6608 - 6647	U32*20		0.1kWh	
46	Battery charge power of today	6648 - 6743	U16*96		1W	
47	Daily battery charge energy from PV	6744 - 6774	U16*31		0.1kWh	
48	Monthly battery charge energy from PV	6775 - 6786	U16*12		0.1kWh	
49	Yearly battery charge energy from PV	6787 - 6826	U32*20		0.1kWh	
50	Reserved	6827-12999				
51	System state	13000	U16			Refer to Appendix 1.1

52	Running state	13001	U16		0.1kWh	Refer to Appendix 1.2
53	Daily PV Generation	13002	U16		0.1kWh	
54	Total PV Generation	13003 - 13004	U32		0.1kWh	
55	Daily export power from PV	13005	U16		0.1kW	
56	Total export energy from PV	13006 - 13007	U32		0.1kWh	
57	Load power	13008 - 13009	S32		1W	
58	Export power	13010 - 13011	S32		1W	
59	Daily battery charge energy from PV	13012	U16		0.1kWh	
60	Total battery charge energy from PV	13013 - 13014	U32		0.1kWh	
61	CO ₂ -reduction	13015 - 13016	U32		0.1kg	
62	Daily direct	13017	U16		0.1kWh	

	energy consumption					
63	Total direct energy consumption	13018 - 13019	U32		0.1kWh	
64	Battery voltage	13020	U16		0.1V	
65	Battery current	13021	U16		0.1A	
66	Battery power	13022	U16		1W	
67	Battery level	13023	U16		0.1%	
68	Battery state of healthy	13024	U16		0.1%	
69	Battery temperature	13025	S16		0.1°C	
70	Daily battery discharge energy	13026	U16		0.1kWh	
71	Total battery discharge energy	13027 - 13028	U32		0.1kWh	
72	Self- consumption of today	13029	U16		0.1%	

73	Grid state	13030	U16		-	0xAA: Off grid; 0x55: On Grid
74	Phase A current	13031	S16		0.1A	
75	Phase B current	13032	S16		0.1A	Refer to Output type (address: 5002) 0: Invalid; 1/2: Valid
76	Phase C current	13033	S16		0.1A	Refer to Output type (address: 5002) 0: Invalid; 1/2: Valid
77	Total active power	13034 - 13035	S32		W	
78	Daily Import Energy	13036	U16		0.1kWh	
79	Total Import Energy	13037~130 38	U32		0.1kWh	
80	Battery Capacity	13039	U16		0.1kwh /Ah	Li-ion: kwh Lead-acid: Ah Applicable types: SH5K-20

						SH3K6 SH4K6 SH5K-V13 SH5K-30 SH3K6-30 SH4K6-30
81	Daily Charge Energy	13040	U16		0.1kWh	
82	Total Charge Energy	13041~130 42	U32		0.1kWh	
83	DRM State	13043	U16	1~9: DRM0~DR M8 Other Value: Invalid		
84	Reserved	13044				
85	Daily export energy	13045	U16		0.1kWh	
86	Total export energy	13046~130 47	U32		0.1kWh	
87	Reserved	13048~130				

		49				
88	Inverter alarm	13050 - 13051	U32			Refer to Appendix 1.3
89	Grid-side fault	13052 - 13053	U32			
90	System fault 1	13054 - 13055	U32			
91	System fault 2	13056 - 13057	U32			
92	DC-side fault	13058 - 13059	U32			
93	Permanent fault	13060 - 13061	U32			
94	BDC-side fault	13062 - 13063	U32			
95	BDC-side permanent fault	13064 - 13065	U32			
96	Battery fault	13066 - 13067	U32			
97	Battery alarm	13068 - 13069	U32			
98	BMS alarm	13070 -	U32			

		13071				
99	BMS protection	13072 - 13073	U32			
100	BMS fault 1	13074 - 13075	U32			
101	BMS fault 2	13076 - 13077	U32			
102	BMS alarm 2	13078~13079	U32			
103	Reserved	13080 - 13099				
104	BMS Status	13100	U16			BMS info. Applicable types: SH5K-20 SH3K6 SH4K6 SH5K-V13 SH5K-30 SH3K6-30 SH4K6-30
105	Max. charging current	13101	U16		A	
106	Max. discharging current	13102	U16		A	
107	Warning	13103	U16			
108	Protection	13104	U16			
109	Fault 1	13105	U16			
110	Fault 2	13106	U16			
111	SOC	13107	U16		1%	

112	SOH	13108	U16		1%	
113	Battery Current	13109	U16		0.1A	
114	Battery Voltage	13110	U16		0.01V	
115	Cycle Count	13111	U16			
116	Average cell voltage	13112	U16			
117	Max cell voltage	13113	U16			
118	Min cell voltage	13114	U16			
119	Battery Pack voltage	13115	U16			
120	Average cell temp.	13116	S16			
121	Max cell temp.	13117	S16			
122	Min cell temp.	13118	S16			

Note: please refer to the troubleshooting chapter in SH-inverter manuals for fault code explanations.

3.2 Parameter setting address definition (holding register)

No.	Name	Address	Data type	Data range	Unit	Note
1	System clock: Year	5000	U16			

2	System clock: Month	5001	U16			
3	System clock: Day	5002	U16			
4	System clock: Hour	5003	U16			
5	System clock: Minute	5004	U16			
6	System clock: Second	5005	U16			
7	Reserved	5006- 12999				
8	Start/Stop	13000	U16	0xCF (Start) 0xCE (Stop) Others (no operation)		
9	Battery maintena nce	13001	U16	0xAA (Maintenance) Others (no operation)		Applic able

						types : SH5K- 20 SH3K6 SH4K6 SH5K- V13 SH5K- 30 SH3K6 -30 SH4K6 -30
10	Load 1 adjustment mode	13002	U16	0: Timing mode; 1: ON/OFF mode; 2: Power optimized mode 3: Disable		
11	Load 1 timing period 1: Start hour	13003	U16	0 - 23	1h	

12	Load 1 timing period 1: Start minute	13004	U16* 10	0 - 59	1min	
13	Load 1 timing period 1: End hour	13005	U16	0 - 23	1h	
14	Load 1 timing period 1: End minute	13006	U16	0 - 59	1min	
15	Load 1 timing period 2: Start hour	13007	U16	0 - 23	1h	
16	Load 1 timing period 2: Start	13008	U16* 10	0 - 59	1min	

	minute					
17	Load 1 timing period 2: End hour	13009	U16	0 - 23	1h	
18	Load 1 timing period 2: End minute	13010	U16	0 - 59	1min	
19	Load 1 ON/OFF mode	13011	U16	0xAA (ON) 0x55 (OFF)		
20	Load 1 power optimized mode: Start hour	13012	U16	0 - 23	1h	
21	Load 1 power optimized mode:	13013	U16	0 - 59	1min	

	Start minute					
22	Load 1 power optimized mode: End hour	13014	U16	0 - 23	1h	
23	Load 1 power optimized mode: End minute	13015	U16	0 - 59	1min	
24	Optimized power of load 1	13016	U16	0 - 5000	1W	
25	Reserved	13017- 13049				
26	EMS mode selection	13050	U16	0: Self-consumption mode (Default); 2: Forced mode (charge/discharge/stop); 3: External EMS mode		
27	Charge/di	13051	U16	0xAA: Charge;		

	charge command			0xBB: Discharge; 0xCC: Stop (Default);		
28	Charge/discharge power	13052	U16	(1)0-5000W Default:1000W (SH5K- 20/SH3K6/SH4K6/SH5K-30/SH3K6- 30/SH4K6-30/SH3.0RS/SH3.6RS/SH4.0RS /SH5.0RS /SH6.0RS) (2) 0-100% of BDC rated power (RO register 5628). Pay attention to Unit Coeff difference (SH5.0RT/SH6.0RT/SH8.0RT/SH10.0RT/SH5. 0RT-20/SH6.0RT-20/SH8.0RT-20/SH10RT- 20/SH5.0RT-V112/SH6.0RT-V112/SH8.0RT- V112/SH10RT-V112/ SH5.0RT- V122/SH6.0RT-V122/ SH8.0RT- V122/SH10RT-V122)	1W	
29	Reserved	13053~ 13054				
30	Battery type	13055	U16	0 Lead-acid Narada 1 Li-ion Samsung 2 No battery 3 Other Lead-acid 4 Li-ion US2000A		Applicable types :

				5 Li-ion LG 6 Li-ion US2000B 7 Li-ion GCL 8 Li-ion BSG 9 Li-ion Sungrow 10 Li-ion BYD 11 Li-ion TAWAKI		SH5K- 20 SH3K6 SH4K6 SH5K- V13 SH5K-
31	Battery nominal voltage	13056	U16	30.0 - 60.0V	0.1V	30 SH3K6 -30
32	Battery capacity	13057	U16	10 - 1000Ah	1Ah	SH4K6 -30
33	Max. SOC	13058	U16	50. 0 - 100.0%	0.1%	
34	Min. SOC	13059	U16	0.0 - 50.0%	0.1%	
35	Battery overvolta ge threshold	13060	U16	48.0 - 70.0V	0.1V	Applic able types :
36	Battery under voltage threshold	13061	U16	32.0 - 48.0V	0.1V	SH5K- 20 SH3K6 SH4K6

37	Battery over- temperatu re threshold	13062	S16	20.0 - 70.0°C	0.1°C	SH5K- V13 SH5K- 30 SH3K6
38	Battery under- temperatu re threshold	13063	S16	-30.0 - 10.0°C	0.1°C	-30 SH4K6 -30
39	Reserved	13064				
40	Terminate d current of constant voltage charging	13065	U16	0.005 - 0.050C	0.001 C	Applic able types : SH5K- 20
41	Max. discharge current	13066	U16	0.100 - 2.000C	0.001 C	SH3K6 SH4K6 SH5K-
42	Max. charge	13067	U16	0.050 - 2.000C	0.001 C	V13 SH5K-

	current					30
43	Constant charge voltage	13068	U16	40.00 - 63.00V	0.01V	SH3K6 -30 SH4K6
44	Terminate d voltage of discharging.	13069	U16	30.000 - 53.000V	0.001 V	-30
45	Emergency charge current	13070	U16	0.025 - 2.000C	0.001 C	
46	Time for fully charge	13071	U16	3s - 10800s	1s	
47	Terminate d current for fully charge	13072	U16	0.005 - 0.050C	0.001 C	
48	Time for constant voltage	13073	U16	3s - 10000s	1s	

	charge					
49	Export power limitation	13074	U16	<p>(1)0 -Nominal output power (SH5K-20/SH3K6/SH4K6/SH5K-30/SH3K6-30/SH4K6-30)</p> <p>(2) Export limit min (RO register 5622) - Export limit max (RO register 5623) .</p> <p>Pay attention to Unit Coeff difference (suitable for SH5.0RT/SH6.0RT/SH8.0RT/SH10.0RT/SH3.0RS/SH3.6RS/SH4.0RS/SH5.0RS/SH6.0RS/SH5.0RT-20/SH6.0RT-20/SH8.0RT-20/SH10RT-20/SH5.0RT-V112/SH6.0RT-V112/SH8.0RT-V112/SH10RT-V112/SH5.0RT-V122/SH6.0RT-V122/ SH8.0RT-V122/SH10RT-V122)</p>	1W	
50	Off-grid option	13075	U16	<p>0xAA: Enable</p> <p>0x55: Disable</p>		
51	Reserved	13076~13079				
52	External EMS heartbeat	13080	U16	<p>1 - 1000</p> <p>If no heartbeat update when timeout, PCS will stop running</p>	1s	Loss if power down

53	Reserved	13081~ 13082				
54	External Signal of Italy	13083	U16	0: External Signal 0 1: External Signal 1 Other: No External Signal		Applicable types
55	Start Charging Power	13084	U16	70~10000	W	: SH5K- 20
56	Start Discharging Power	13085	U16	70~3000	W	SH3K6 SH4K6 SH5K- V13 SH5K- 30 SH3K6 -30 SH4K6 -30
57	Meter Comm. Detection	13086	U16	0xAA: Enable 0x55: Disable		

58	Export Power Limitation	13087	U16	0xAA: Enable 0x55: Disable	Applicable types : SH5.0 RT SH6.0 RT SH8.0 RT SH10R T SH3.0 RS SH3.6 RS SH4.0 RS SH5.0 RS SH6.0 RS
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						SH5.0
						RT-20
						SH6.0
						RT-20
						SH8.0
						RT-20
						SH10R
						T-20
						SH5.0
						RT-
						V112
						SH6.0
						RT-
						V112
						SH8.0
						RT-
						V112
						SH10
						RT-
						V112
						SH5.0
						RT-

						V122 SH6.0 RT- V122 SH8.0 RT- V122 SH10 RT- V122
59	Reserved	13088~ 13099				
60	Reserved SOC for backup	13100	U16	0~100	%	

Note:

Communication address = protocol address – 1. If data of address 5000 is to be inquired, the corresponding sending address data is 4999 (0x1387);

U16: 16-bit unsigned integer, big-endian;

U32: 32-bit unsigned integer; little-endian for double-word data. Big-endian for byte data;

S16: 16-bit signed integer, big-endian;

S32: 32-bit signed integer; little-endian for double-word data. Big-endian for byte data

Power factor: + means leading; - means lagging, 1000 means power factor 1.000, 950 means power factor 0.95.

4. Appendix

Appendix 1.1 System state

Stop	0x0002
Standby	0x0008
Initial standby	0x0010
Startup	0x0020
Running	0x0040
Fault	0x0100
Running in maintain mode	0x0400
Running in forced mode	0x0800
Running in off-grid mode	0x1000
Restarting	0x2501
Running in External EMS mode	0x4000

Appendix 1.2 Running state

Running state (Power flow)			
Bit0	PV power	Bit0 == 0	No power generated from PV

		Bit0 == 1	Power generated from PV
Bit1	Battery charging	Bit1 == 0	Not charging
		Bit1 == 1	Charging
Bit2	Battery discharging	Bit2 == 0	Not discharging
		Bit2 == 1	Discharging
Bit3	Positive load power	Bit3 == 0	Load is reactive
		Bit3 == 1	Load is active
Bit4	Feed-in power	Bit4 == 0	No power feed-in the grid
		Bit4 == 1	Power feed-in the grid
Bit5	Import Power from grid	Bit5 == 0	No power imported from the grid
		Bit5 == 1	Importing power from grid
Bit6	Reserved	Bit6	
Bit7 (Refitting System)	Negative load power	Bit7 == 0	No power generated from "Load"
		Bit7 == 1	Power generated from "Load"

Appendix 1.3 Fault code instructions

Inverter fault analysis by bit:

For example:

Inverter alarm: 0x00102000 (0001 0000 0010 0000 0000 0000b)

bit13 & bit20 is set.

According the following table, the low word base code of the inverter alarm is 70 and the high word base code is 500. So the bit13 represents a fault code of 083 (i.e. 70+13), and the bit 20 represents a fault code of 504 [i.e. 500+(20-16)].

Inverter alarm 13050 - 13051	Low word base code: 70	DC-side fault 13058 - 13059	Low byte base code: 19	Battery fault 13066 - 13067	Low byte base code: 700	BMS fault 1 13074 - 13075	Low byte base code: 832
	High word base code : 500		High word base code: 200		High word base code: 716		High word base code: 848
Grid-side fault 13052 - 13053	Low word base code: 2	Permanent fault 13060 - 13061	Low word base code: 401	Battery alarm 13068 - 13069	Low word base code: 900	BMS fault 2 13076 - 13077	Low word base code: 864
	High word base code :		High word base code: 417		High word base code: 916		High word base code: 880

	100						
System	Low	BDC-side	Low word	BMS	Low word	BMS	Low word
fault 1	word	fault	base	alarm	base code:	alarm 2	base code:
13054 -	base	13062 -	code: 600	13070 -	932	13078 -	964
13055	code : 300	13063		13071		13079	
	High		High word		High word		High word
	word		base		base code:		base code:
	base		code: 616		948		980
	code : 316						
System	Low	BDC-side	Low word	BMS	Low word		
fault 2	word	permanent	base	protection	base code:		
13056 -	base	fault	code: 800	13072 -	732		
13057	code: 36	13064 -		13073			
	High	13065	High word		High word		
	word		base		base code:		
	base		code: 816		748		
	code: 52						

Appendix 1.4 Examples

Take ComTest for example.

1.1 Acquire one piece of running information

Supposed that the inverter address is 1, it needs to acquire data from address 5000 of 3x address type.

The PC sends (HEX):

01 04 13 87 00 01 85 67

The inverter replies (HEX):

01 04 02 00 22 39 29

Note: The type code of inverter SG4KTL is 0x0022.

1.2 Acquire multiple running information

Supposed that the inverter address is 1, it needs to acquire 10 data from address starting from 5000 of 3x address type

The PC sends (HEX):

01 04 13 87 00 0A C4 A0

The inverter replies (HEX):

01 04 14 00 22 00 28 00 00 00 00 05 00 00 00 26 00 00 00 00 00 00 AF F8

Note: The type code of inverter SG4KTL is 0x0022. The nominal output power is 4.0 kW, two-phase. Daily power generation is 0. The total power generation is 5 kWh. The total running time is 38 h. The internal temperature is 0°C. The internal transformer temperature is 0°C.

1.3 Acquire SN

Supposed that the inverter address is 1, it needs to acquire 10 data from address starting from 4990 of 3x address type

The PC sends (HEX):

01 04 13 7D 00 0A E4 91

The inverter replies (HEX):

01 04 14 31 32 31 32 31 32 30 30 31 00 00 00 00 00 00 00 00 00 00 9B 56

Note:

1. SN data type is UTF-8;

2. Serial number is: 121212001

1.4 Read one setting datum

Supposed that the inverter address is 1, it needs to read data from address 5000 of 4x address type.

The PC sends (HEX):

01 03 13 87 00 01 30 A7

The inverter replies (HEX):

01 03 02 07 D8 BA 2E

Note: the data read out is year 2008.

1.5 Read multiple setting data

Supposed that the inverter address is 1, it needs to read 10 data from address starting from 5000 of 4x address type.

The PC sends (HEX):

01 03 13 87 00 0A 71 60

The inverter replies (HEX):

01 03 14 07 DA 00 0A 00 1E 00 09 00 28 00 25 00 CE 00 AA 01 F4 00 00 80 53

Note: The data are October 30th, 2010, 09:40:37; Stop; power limitation enabled, power

limitation value is 50%.

1.6 Set one datum

Supposed that the inverter address is 1, it needs to set data from address 5000 of 4x address type.

The PC sends (HEX):

01 10 13 87 00 01 02 07 DA 19 4D

The inverter replies (HEX):

01 10 13 87 00 01 B5 64

Or

The PC sends (HEX):

01 06 13 87 07 DA BE CC

The inverter replies (HEX):

01 06 13 87 07 DA BE CC

Note: The setting data is year 2010

1.7 Set multiple data

Supposed that the inverter address is 1, it needs to set 10 data to address starting from 5000 of 4x address type.

The PC sends (HEX):

01 10 13 87 00 0A 14 07 D9 00 0A 00 1E 00 09 00 10 00 00 00 CE 00 AA 01 F4 00 00 3E 65

The inverter replies (HEX):

01 10 13 87 00 0A F4 A3

Note: The data are October 30th, 2009, 09:16:00, stop, power limitation enabled, power

limitation value is 50%.

SUNGROW POWER