Communication Protocol for Logger

Modbus V1.0.2.0

Upgrade history:

Ver. No.	Edited by	Edited date	Changed content and reason	Checked by	Approved by
1.0.1.3	Xu Shunan	2013/9	Newly edited		
1.0.1.4	Xu Shunan	2014/4	Add digital input, output measuring point, reserved		
1.0.1.5	Xu Shunan	2014/9	Add accumulative reactive output power measuring point		
1.0.1.6	Xu Shunan	2015/8	Add AGC/AVC dispatch measuring point	Chen Xiaohu	Song Shi
1.0.1.7	Xu Shunan	2016/8	Add nominal active power, reactive power measuring point		
1.0.1.8	Xu Shunan	2016/11	Add longitude and latitude data, add digital output state display, add ADC output value, delete work state		
1.0.1.9	Xu Shunan	2017/3	Adjust the today’s power yield unit to kWh		
1.0.2.0	Yu Junjun	2018/3/	Change product logo and product name		

一、 Introduction

This communication protocol, adopting MODBUS RTU/TCP protocol, applies to the communication between Sungrow LoggerV3/Logger3000 and the upper computer (PC) monitoring software. This protocol can read the real-time operating data and sensor information of the LoggerV3/Logger3000. The default communication address of LoggerV3/Logger3000 is 247.

二、 Communication Interface

1) RS485 (default port: A2B2; Baud rate: 9600bps; Check bit: Null; data bit: 8; stop bit: 1)\
2) Ethernet (Default IP: 192.168.1.100; Subnet mask: 255.255.0.0; Port(Logger3000): 502/503/504/505/506; Port(LoggerV3): 502/503. Each port supports one TCP link.)

三、 Definition of Address

三.1 Running information variable address definition (read-only register, supporting 0x04 function code)

No.	Name	Address	Data type	Data range	Unit
1	Device type code	8000	U16	0x0701 LoggerV3 0x0705 Logger3000	
2	Protocol No.	8001-8002	U32		
3	Communication protocol ver.	8003-8004	U32	Example: V1.0.1.9 Transmission order: little-endian for double-word data.	

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				Big-endian for byte data. The data transmitted are 0x01 0x09 0x01 0x00	
4	Total number of devices connected	8005	U16		pcs
5	Total number of fault device	8006	U16		pcs
6	Total active power	8007-8008	U32		W
7	Daily power yields	8009-8010	U32		kWh
8	Total reactive power	8011-8012	S32		var
9	Total power yields	8013-8014	U32		kWh
10	Reserved	8015-8016	U32		
11	Reserved	8017-8020	U16		
12	Digital input state	8021-8022	U32	Each bit stands for the state of one digital output 0: common terminal and normal close terminal are closed 1: common terminal and normal open terminal are closed	
13	Reserved	8023-8024	U32	Original: work state	
14	Reserved	8025-8026	U32		
15	PT100-1	8027	S16		0.1℃
16	PT100-1	8028	S16		0.1℃
17	ADC1 voltage	8029	S16		0.01V
18	ADC1 current	8030	S16		0.01mA
19	ADC2 voltage	8031	S16		0.01V
20	ADC2 current	8032	S16		0.01mA
21	ADC3 voltage	8033	S16		0.01mV
22	ADC4 voltage	8034	S16		0.01mV
23	Reserved	8035-8053			
24	Longitude	8054-8055	S32		0.0001 °
25	Latitude	8056-8057	S32		0.0001 °
26	Max. total nominal active power	8058	U16		kW
27	Min. total nominal active power	8059	U16		kW
28	Max. total nominal reactive power	8060	S16		kvar
29	Min. total nominal reactive power	8061	U16		kvar
30	Inverter actual total active power	8062-8063	U32		W

31	Inverter actual total reactive power	8064-8065	S32		var
32	Inverter preset total active power	8066	U16		kW
33	Inverter preset total reactive power	8067	S16		kvar
34	Start/Stop state of Logger	8068	U16	0: Stop 1: Start	
35	Lock state of Logger	8069	U16	0: Lock 1: Unlock	

三.2 Information variable setting address definition (write-only register, supporting 0x06 function code)

No.	**Name**	**Address**	**Data type**	**Data range**	**Unit**
1	Set the active power for subarray inverter	8000	U16		kW
2	Set the reactive power for subarray inverter	8001	S16		kvar
3	Set the start/stop for subarray inverter	8002	U16	0: Stop 1: Start	

Note:
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
Address starts from 1. Communication address = protocol address – 1;

Longitude and latitude data

Example 1:
The background communicates with the Logger via the network. The address of Logger is 247. When the background has bound to the 502 port of the Logger, the background needs to check the digital input state of the Logger,
Background sends:
00 00 00 00 00 06 F7 04 1F 55 00 01
Logger replies:
00 00 00 00 00 05 F7 04 02 0F FE
Where,
00 00 00 00 00 06 and 00 00 00 00 00 05 are messages headers of the Modbus TCP; F7 is the address of the Logger; 04 is the function code; 0x1F55 = 8021, i.e. check the data of register 8022. According to this protocol, register 8022 is the “digital input state (DIN)”.
The data of 8022 register in the replied message is 0x0FFE.

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The replied data by Logger are 0x0FFE. Since the Logger V3 has 12-input digital input, the data of the latter 12 bits are valid. After converting 0x0FFE to binary data, the last bit of 0x0FFE is 0 while the other bits are 1. According to this protocol, the state of DIN1 of the Logger is closed and other ports are open.

Example 2: AGC/AVC dispatch
1. It is advisable to use the port 503 of Modbus TCP for the AGC&AVC dispatch while the port 502 for data checking.
2. The recommended dispatch period ≥1min
3. Read the dispatch related parameters:
Send instruction: 00 00 00 00 00 06 F7 04 1F 7D 00 08
Relay data: 00 00 00 00 00 13 F7 04 10 45 03 00 20 09 30 00 00 08 44 00 03 00 01 00 01
Sequence of data:
Total active power: 2114.819 kW; total reactive power: 2.352 kvar; total preset active power: 2116 kW; total preset reactive power: 3 kvar; Logger in start state; Logger in unlock state.
4. Set the total active power to 2116kW
Send instruction: 00 00 00 00 00 06 F7 06 1F 3F 08 44
Replay data: 00 00 00 00 00 06 F7 06 1F 3F 08 44
5. Set the total reactive power to 3kvar
Send instruction: 00 00 00 00 00 06 F7 06 1F 40 00 03
Replay data: 00 00 00 00 00 06 F7 06 1F 40 00 03

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