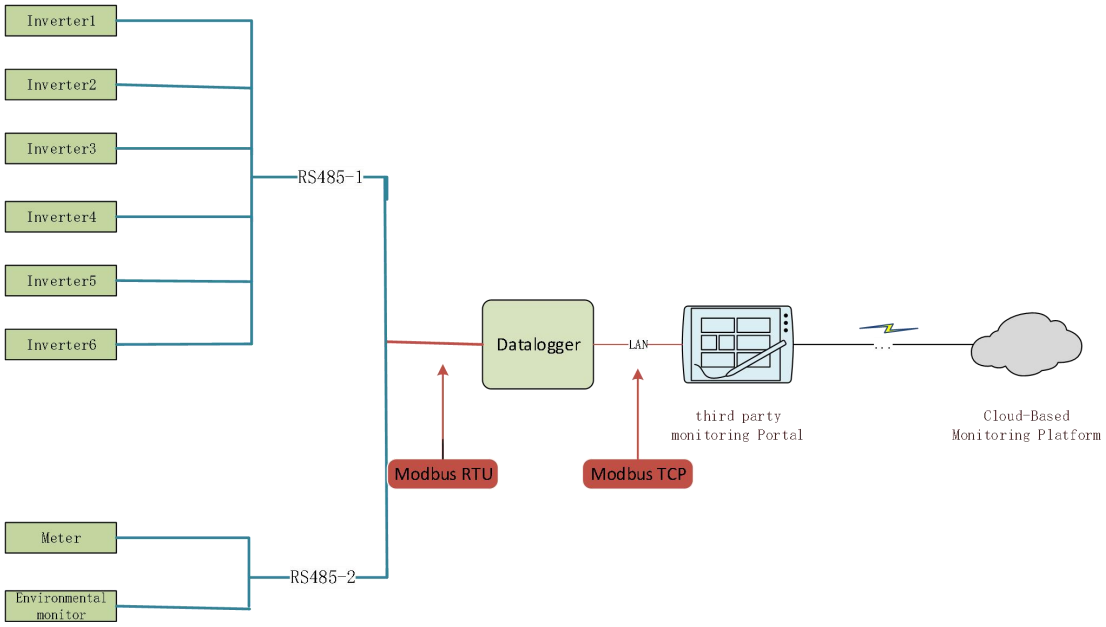
ShineMaster（Modbus TCP）

1. System topology diagram



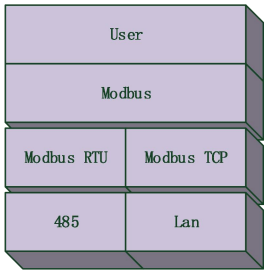
2. Topology diagram description

- The third-party system is connected to the Datalogger through a network cable and the Datalogger communicates with each inverter through a 485 line.

- The communication protocol between the third-party system and Datalogger uses Modbus TCP, and the protocol between Datalogger and inverters uses Modbus RTU. Datalogger is acting as an intermediary to convert Modbus TCP protocol to Modbus RTU protocol, and the customer still needs to read and set the inverter values according to the customer still needs to read and set the inverter values according to growatt's inverter protocol hosting table.

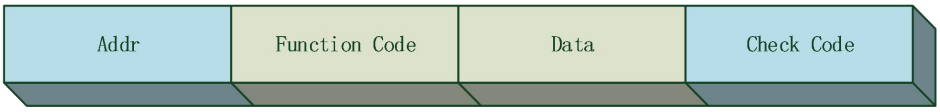
- The first 485 of Datalogger is connected to the inverter and the second 485 is connected to the meter.

3. Modbus Protocol Description



- Modbus TCP and Modbus RTU are both Modbus protocols, with a slight difference in the data format of the protocols due to the different mediums implemented (485 vs. Lan).

- Modbus RTU protocol data format:

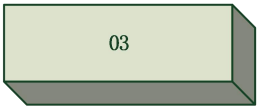


- Modbus TCP/IP protocol data format:

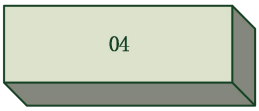
- Modbus TCP and Modbus RTU are both Modbus protocols, only the connection method used is different. Except for the difference in data header and inspection method, the content format of the slave data read is the same.

- Function Code Description

Commonly used function codes are: 03 and 04:

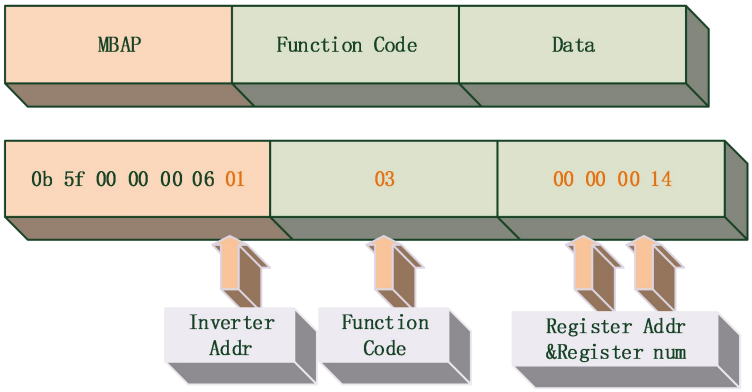


Read the holding register in the register table



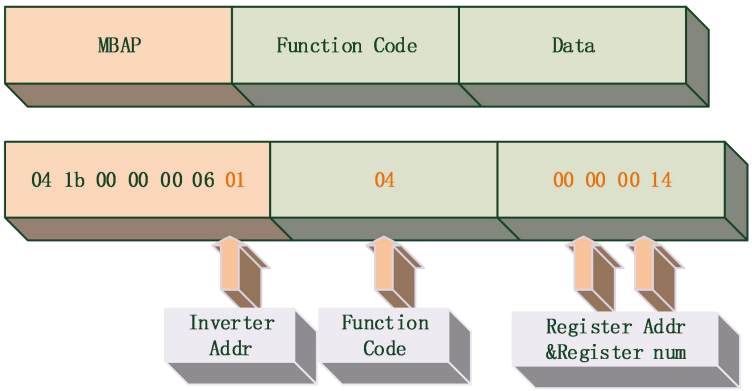
Read the input register in the register table

- If users use third-party data to read the holding registers (20 in total from 0 to 19) of inverter No. 1, the 03 command code is used



The above is the data sent to Datalogger by the third-party system, in which there are seven numbers in MBAP, the first six numbers could be ignored, the seventh number 01 is the inverter address, the middle is the command code 03, Data area is the data written according to the requirements of our Modbus RTU protocol, the first two numbers 00 00 indicates the starting address of the register: the starting address is 0, the next two numbers 00, 14 is the number of addresses, need to be converted to decimal, because the number in the protocol are hexadecimal numbers, 00 14 converted to decimal is 20 registers.

- If users use third-party data to read the input registers (20 in total from 0-19) of inverter No. 1, the 04 command code is used



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4. How the third party system reads the inverter register data through Datalogger

    - The register table in growatt's Modbus RTU protocol is only available for growatt's inverters.

    - First, Datalogger reads the register data of the inverter based on the register address provided by the register protocol. The third party system reads the register data of the inverter through Datalogger, which tells Datalogger that it wants to get the data of one of the inverter registers, and Datalogger will read it according to the register address requested by the third party system and then return the data to the third party system. The register is the register table of the inverter itself, so users only need the register table in the Modbus RTU protocol of the Growatt inverter itself.

    - The register table of the inverter's register RTU protocol is also applicable in the Modbus TCP protocol.

5. Datalogger and third-party system IP configuration

    - Login to the built-in page, use account admin000 and password admin000 to login.

    - Example: Datalogger's IP is set to fixed IP, 192.168.10.101

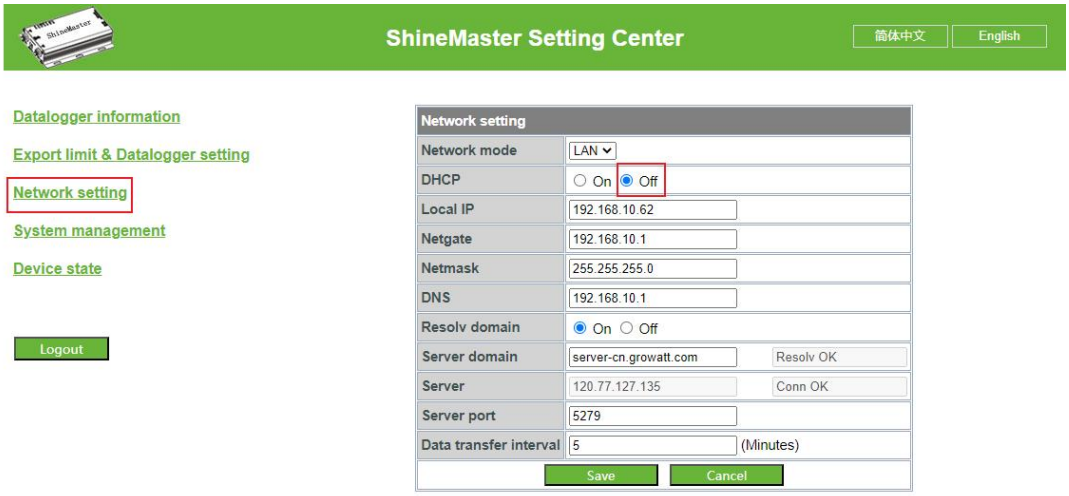


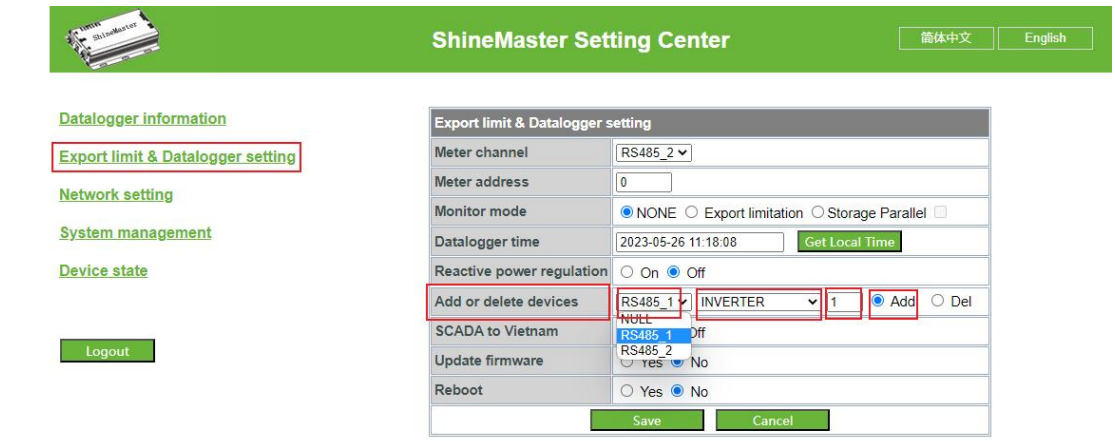
Figure 1. IP configuration

- The IP of the third party platform is set to 192.168.10.100 (as long as it is at 192.168.10.1/253 and does not use the same IP as Datalogger)

- User needs to make sure that Datalogger is on the same LAN as the third-party system (e.g., under the same router).

6. Datalogger “Adds inverter equipment”

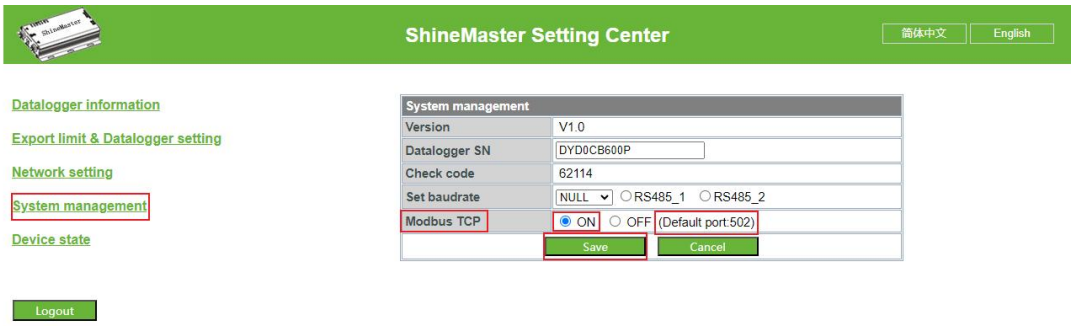
- In "Export limit & Datalogger setting", add the inverter, select "RS485_1" for RS485 channel, select "INVERTER" for device type, fill in the address according to the actual address and check "Add", click "Save" to save. INVERTER", add the address according to the actual address, and check "Add", click "Save" to save.



- After adding a device, users can view it in "Device state".

7. Datalogger “Third-party server adaptation”

- Click "System management", select the Modbus TCP enable switch and click Save. (Login account must be admin000 to be valid) (Default TCP port number is 502)



8. Configuration of third-party systems

- The IP of the third party system is set to 192.168.10.100 and needs to be on the same LAN as Datalogger (e.g., under the same router)

9. How to read inverter data using a third-party system

- The simulation software used here is a third-party system, the operation interface is different, but the necessary settings can be referred to

- Since users have chosen the device address for the address mode, so here to use its own device address 1 to read the parameters of the inverter. If users have chosen the system address for the address mode, it has to read the inverter parameters using the system address to which the inverter is assigned.

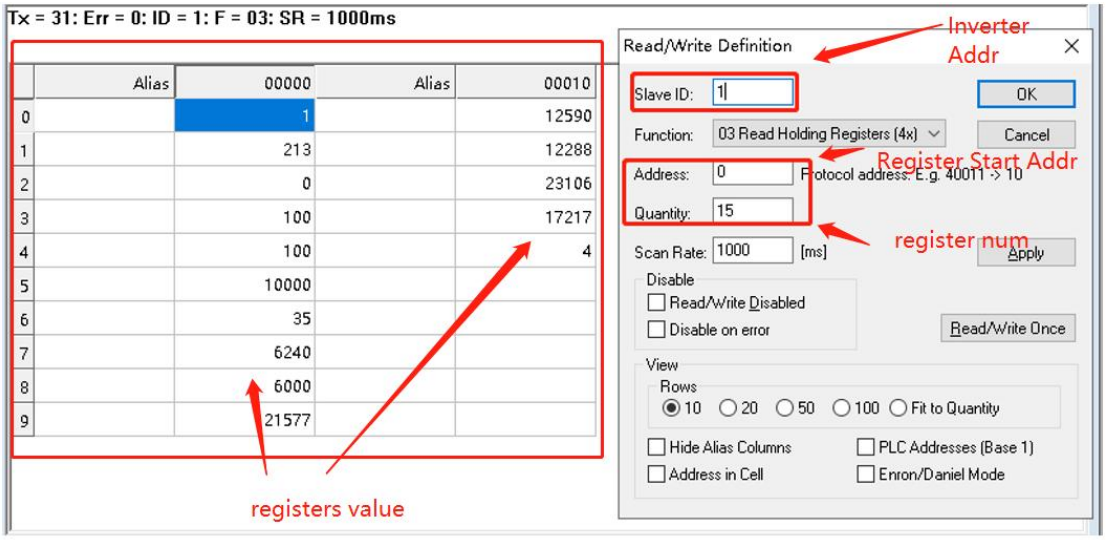
- The inverter data is read according to the register table of Growatt's Modbus protocol

- Read the 03-segment register of the inverter with address 1, read 0-14, 15 registers in total

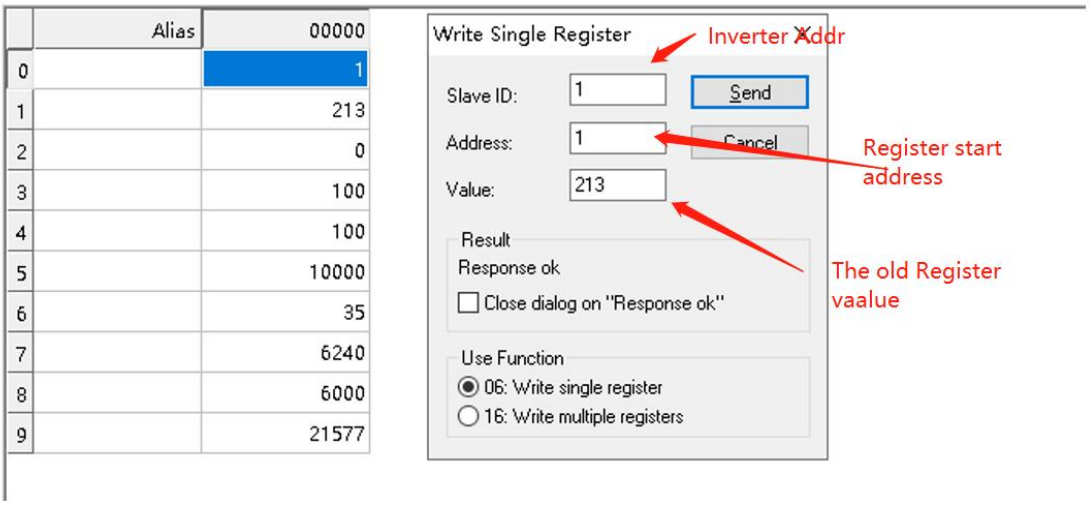
  Modbus RTU protocol register table according to the inverter

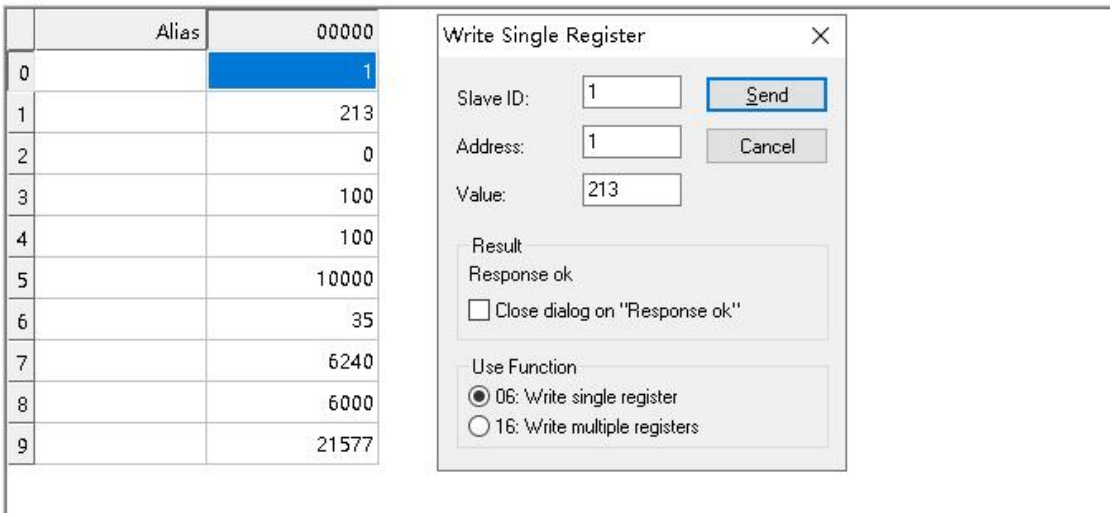
4.1 Holding Reg.

Register NO.	Variable Name	Description	Write or not	Value	Unit	Initial value	Note
First group							
00	OnOff	Remote On/Off .(On(1)：Off(0)Inverter On (3)：Off (2) BDC	W	0、1、2、3		1	The inverter can be switched on and off, and the BDC can be switched on and off for the batt ready function.
01	SaftyFuncEn	Bit0: SPI enable Bit1: AutoTestStart Bit2: LVFRT enable Bit3:FreqDerating Enable Bit4: Softstart enable Bit5: DRMS enable Bit6:PowerVoltFunc Enable Bit7: HVFRT enable Bit8:ROCOF enable Bit9: Recover FreqDeratingMode Enable Bit10：Split phase Bit11: AC Couple enable Bit12~15:预留	W	0 disable 1: enable			SPI: system protection interface Bit0~3:for CEI0-21 Bit4~6:for SAA
02	PF CMD memory state	Set Holding register3,4,5,99 CMD will be memory or not(1/0), if not, these settings are the initial value.	W	0or1		0	Means these settings will be acting or not when next power on
03	Active P	Inverter Max output	W	0-100 or	%	255	255: power is not be limited

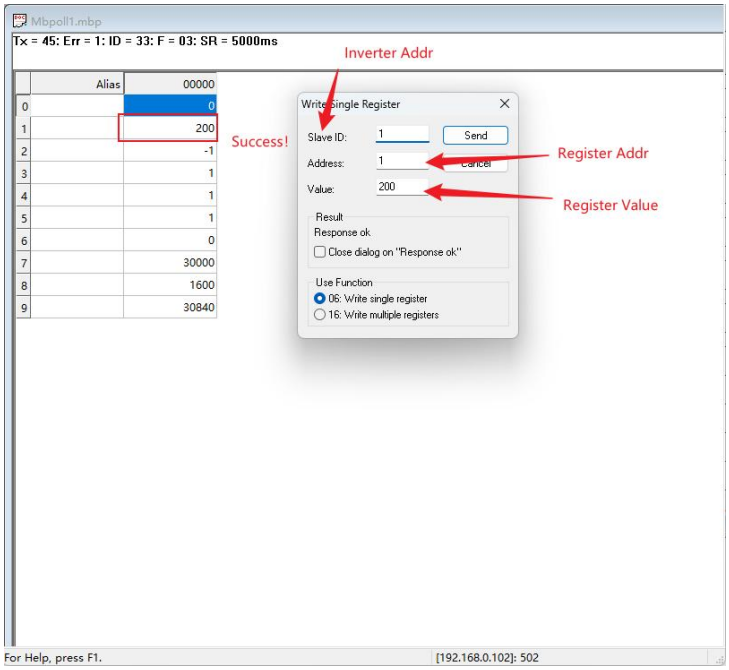


- Set the 03 zone of Inverter No. 1, register No. 1 to 200, and read to check
  First check inverter No. 1, block 03, register No. 1 originally had a value of 213.





Modify the value of register 1 to 200, success



Tx = 92: Err = 2: ID = 33: F = 03: SR = 5000ms