Modbus/Sever API Guide

V1.0 EN

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Document Version

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1. Dispatch Function

1.1 Method of dispatch

The system support three modes of dispatch: Server, MODBUS, and CAN. The Server and MODBUS communication are more frequently used as CAN.

1.2 Dispatch mode

Table 1: Dispatch mode

1	Battery only charges from PV	In this mode, the battery is not allowed to discharge (Pdispatch <32000). After the PV supplies the load, the excess energy is used to charge the battery. When the battery is charged, there is surplus power to the grid.
2	State of Charge control	Force charge mode. The charge or discharge process will be stopped until it reaches the SOC setting value.
3	Load Following	The system will be self-consumption mode.
4	Maximise Output	If the current PV power can not meet the required inverter AC output power, the battery will also discharge.
5	Normal Mode	The system will be self-consumption mode.
6	Optimise Consumption	Currently PV will charge batteries firstly. If the PV power cannot meet the maximum battery charging power, it will also absorb electricity from the grid to charge the battery.
7	Maximise Consumption	It will only absorb electricity from the grid to charge the battery.
19	No Battery Charge (only for specifical EMS version)	The system will be self-consumption mode,the charging power does not exceed the set power.

2. Dispatch Command

2.1 Server Command：

The dispatch command in AlphaCloud API is written in Table 2. These 8 parameters are only control parameter. STATUS should be set 1 by turning on dispatch mode, 0 by turning off dispatch mode； The run time of dispatch can be given as wished.

Table 2: Parameter list for dispatch on server

Mode	Para 1	Para 2	Para 3	Para 4	Para 5	Para 6	Para 7	Para 8
1	P	0	0	1	0	0	0	PV: 1: turn on, 2: turn off.
2	P		SOC to stop	2				
3	P		0	3				
4	0		0	4				
5	P		0	5				
6	0		0	6				
7	0		0	7				
19	0		0	19				

Para1 = Offset（32000）± target power value （+: to grid；-: from grid）, Para3 sets the SOC value. If the system arrives this setpoint, the dispatch will stop. Para3= SOC / 0.4. Attention, if the battery is wished to discharge, the SOC value should be smaller than current SOC, similarly by battery charge.

Para8 sets the On/Off states of PV generator. If the system does not support PV control，The value can be set to 0.

Para2，Para5，Para6，Para7 can be set to 0，

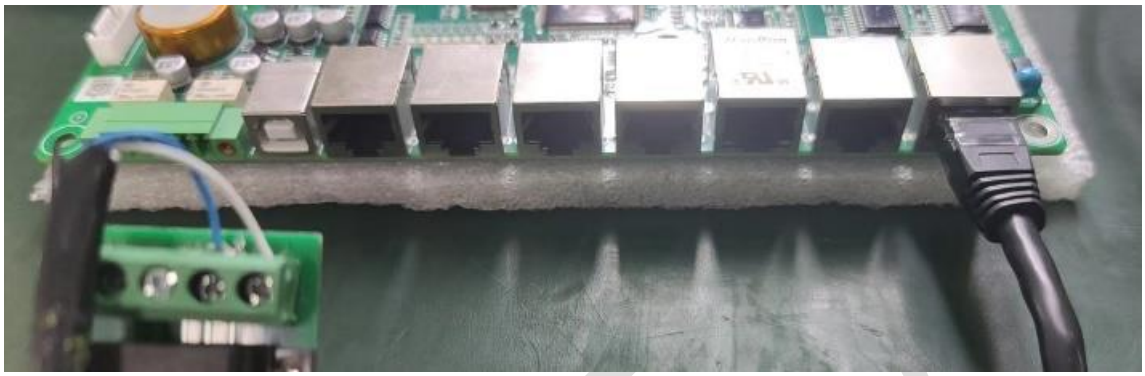
2.2 MODBUS Command：

Alpha Modbus Protocol.docx Register parameter list.do

2.2.1 Connection

One side 4 – B, 5– A connection to port 485，the other side 568B connection to EMS board CAN/485.

Figure 1: Connection



2.2.2 MODBUS Configuration

Please refer to Alpha Modbus Protocol.docx for MODBUS protocol，Baud rate is 9600，the default address is 0x55, the function code for reading is 0x03，and the function code for writing is 0x10，the last two bits checksum is CRC16 for MODBUS. High digits are right at the end, and there is a serial port automatically generated.

Under the normal communication condition, you could send the following command code after all connection for testing: 55 03 01 00 00 02 C8 23 (55 is the default MODBUS address；03 stands for reading；01 00 stands for register 0100；00 02 means starting from 0100 register and reading two registers more，which are 0100 (battery voltage value) and 0101 (battery current value) registers，；C8 23 are automatically generated checksum for CRC).

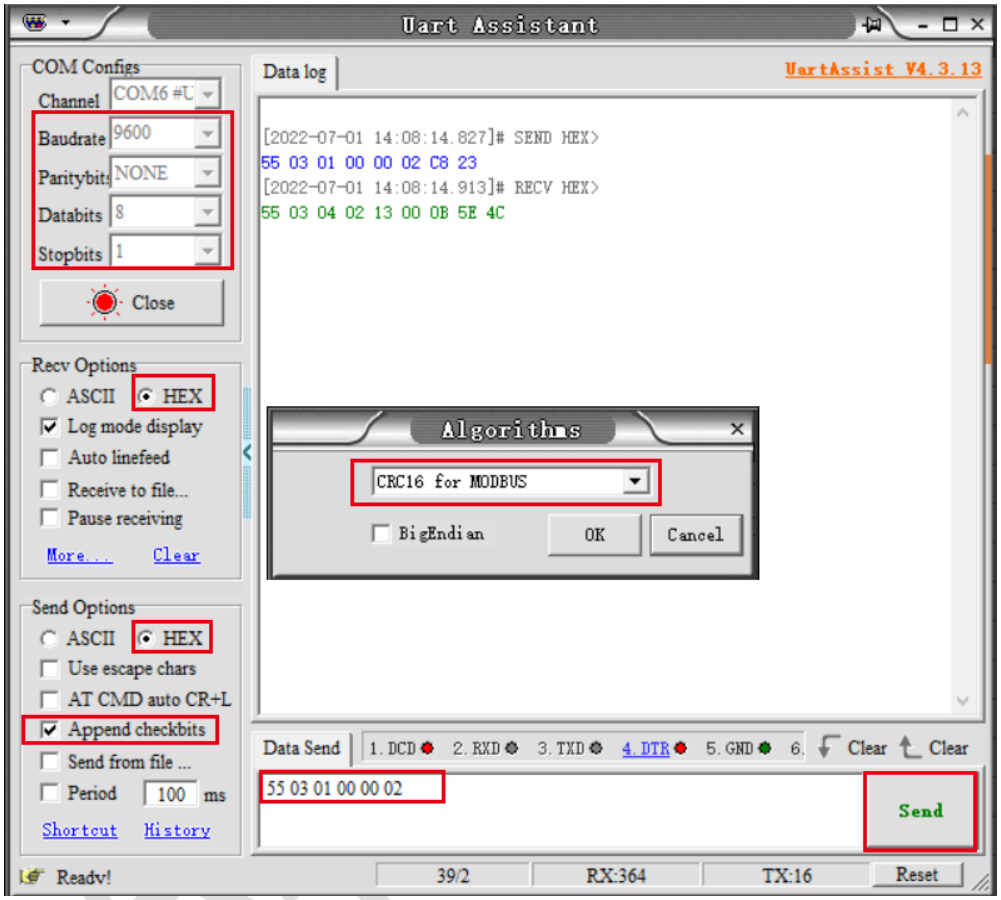
Figure 2: Register 0100H and 0101H

			2byte		0.01
Household Battery					
0100H	Battery voltage	RO	Occupy 2 byte	unsigned short	0.1V/bit
0101H	Battery current	RO	Occupy 2 byte	short	0.1A/bit

After sending the command, the system will receive digits for example 55 03 04 02 13

00 0B 5E 4C（55 is MODBUS default address；03 stands for reading；04 stands for 2 times of the number of the register read，02 13 is the battery voltage value in 0100 register，its decimal form is 531, which is transformed as 53.1V；00 0B is the battery current value which is stored in 0101 register, the decimal form is 11，which is transformed as 1.1A; 5E 4C are automatically generated CRC checksum）.

Figure 3: Configuration of dispatch by MODBUS



By checking the reading function of MODBUS, the communication functionality is also proved to work normally, it is the time to begin dispatch. There are 6 parameters，9 registers. All registers should receive correct command to execute dispatch.

The MODBUS dispatch follows the same logic as dispatch in Server.

Table 3: Parameter list for dispatch with MODBUS

Mode	Para 1	Para 2	Para 3	Para 4	Para 5	Para 6	Para 7	Para 8
1	STATUS 1: dispatch active, 0: dispatch deactivate active power	P	Q (set to 0)	1	0	Time (s)	0	PV: 1: turn on, 2: turn off
2		P		2	SOC to stop			
3		P		3	0			
4		0		4	0			
5		P		5	0			
6		0		6	0			
7		0		7	0			
19		0		19	0			

Para2 is the active power,

Para2= Offset（32000）± target power value （+: to grid；-: from grid）, Para3 is the reactive power, which can be set 0.

Para5 sets the SOC value. If the system arrives this setpoint, the dispatch will stop. Para5 = SOC / 0.4. Attention, if the battery is wished to discharge, the SOC value should be smaller than current SOC, similarly by battery charge.

Para6 is the dispatch time.

Figure 4: Register list for dispatch by MODBUS

Dispatch					
0880H	Dispatch Start	R/W	Occupy 2 byte	unsigned short	1:start; 0: stop
0881H 0882H	Dispatch Active power	R/W	Occupy 4byte	Int	1W/bit Offset:32000 charge:<32000 discharge:>32000
0883H 0884H	Dispatch Reactive power	R/W	Occupy 4byte	Int	1var/bit Offset:32000 charge:<32000 discharge:>32000
0885H	Dispatch Mode	R/W	Occupy 2 byte	unsigned short	Note7
0886H	Dispatch SOC	R/W	Occupy 2 byte	unsigned short	0.4%/bit example: Send SOC=95,corresponding to the SOC of 38%.
0887H 0888H	Dispatch Time	R/W	Occupy 4 byte	unsigned int	1s/bit

2.2.3 MODBUS Dispatch Example

Example ([HEX])：55 10 08 80 00 09 12 00 01 00 00 75 30 00 00 00 00 00 02 00 FA 00 00 01 F4 A9 D155

55: MODBUS default address；**10**: writing ；**08 80**: start from register 0880; **00 09**: counter nine register from 0880 register；**12**(18 in DEC): number of register read x 2; **00 01**: para1, dispatch active; **00 00 75 30**(30000 in DEC): para 2, battery charge with 2kW; **00 00 00 00**: para 3; **00 02**, para 4: dispatch mode 2; **00 FA**(250 in DEC): para 5: SOC to stop is 100%； **00 00 01 F4**(500 in DEC): para 6, dispatch time is 500s; **A9 D1** is the CRC checksum）

Figure 5: Example of dispatch command

```
[2022-07-22 15:52:58.889]# SEND HEX>
55 10 08 80 00 09 12 00 01 00 00 75 30 00 00 00 00 00 02 00 FA 00 00 01
F4 A9 D1
[2022-07-22 15:52:58.974]# RECV HEX>
55 10 08 80 00 09 0E 53
```

The battery should then enter in dispatch mode 2 and charging with 2kW, until the battery is full charged.