QUCC Modbus/RTU Communication protocol

一、 Form of agreement

1. Modbus RTU Overview of communication protocol
Electrical interface: RS485 half duplex
Baud rate: 9600 / 38400 / 115200 (adjustable)
address： 0-255 (adjustable)
Error detection: CRC16
Bits per byte: 1 start bit, 8 data bits (LSB sent first), no parity, 1 stop bit.
Supported MODBUS function codes:
03 (0x03) function code: read and hold register
06 (0x06) function code: write save register
10 (0x10) function code: write save register

Battery information register (0x1000-0x1036)								
0x1000	2	Cell_Num	unsigned int	Total number of strings	R	03	1	Up to 32S
0x1001	2	Run_Time	unsigned int	Equipment running time	R	03	1	Record the effective running time of the equipment
0x1002	2	HSOC	unsigned int	Battery health	R	03	1	Battery health
0x1003	2	Voltage	unsigned int	Total cell voltage	R	03	0.01V	Total battery voltage, if the value read in this register is 5630, it means 56.30V
0x1004	2	CurCadc	unsigned int	Real time current	R	03	0.1A	Current = CurCadc/10-1000 Charge is negative discharge and if the value of reading the register is 9800, it is the charging current 20A
0x1005	2	Temp1	unsigned int	Temperature 1	R	03	0.1℃	Temperature = Temp1/10-40 If the value of the register is 755, it is 35.5 ℃
0x1006	2	Temp2	unsigned int	Temperature 2	R	03	0.1℃	Same thing as above
0x1007	2	Temp3	unsigned int	Temperature 3	R	03	0.1℃	Same thing as above
0x1008	2	Temp4	unsigned int	Temperature 4	R	03	0.1℃	Same thing as above
0x1009	2	Temp5	unsigned int	Temperature 5	R	03	0.1℃	Same thing as

								above
0x100A	2	Temp6	unsigned int	Temperature 6	R	03	0.1℃	Same thing as above
0x100B	2	Tmax	unsigned int	Max temperature	R	03	0.1℃	Same thing as above
0x100C	2	Tmin	unsigned int	Mini temperature	R	03	0.1℃	Same thing as above
0x100D	2	Vmax	unsigned int	Max voltage of unit cell	R	03	1mV	The value of this register is 3560, it means 3560 MV
0x100E	2	Vmin	unsigned int	Mini voltage of unit cell	R	03	1mV	Same thing as above
0x100F	2	Vmaxmin No	unsigned int	Series corresponding to the highest and lowest voltage of cell	R	03	1	The high byte of the register corresponds to the highest voltage in the battery pack, and the low byte corresponds to the lowest voltage in the battery pack.
0x1010	2	RSOC	unsigned int	Remaining power of battery pack %	R	03	1%	0%-100%
0x1011	2	FCC	unsigned int	System full capacity	R	03	0.01AH	The register value is 6000, it means 60.00Ah
0x1012	2	RC	unsigned int	Current remaining capacity of battery pack	R	03	0.01AH	The register value of 5080 is 50.80Ah
0x1013	2	CycleCount	unsigned int	Cycle discharge times	R	03	1	The value of this register is 60, it means 60 cycles
0x1014	2	PROTECT	unsigned int	Reasons for protection	R	03	/	See the protection reason table
0x1015	2	ALARM	unsigned int	Alarm level	R	03	/	It can be divided into 1, 2 and 3 grades. Grade 3 is the most serious
0x1016	2	PackStatus	unsigned int	System state	R	03	/	See PackStatus table
0x1017	2	VCell1	unsigned int	Voltage corresponding to unit cell	R	03	1mV	The value of this register is 3560, it means 3560mV
0x1018	2	VCell2	unsigned int		R	03	1mV	Same thing as above
0x1019	2	VCell3	unsigned int		R	03	1mV	Same thing as above
0x101A	2	VCell4	unsigned int		R	03	1mV	Same thing as above
0x101B	2	VCell5	unsigned int		R	03	1mV	Same thing as above
0x101C	2	VCell6	unsigned int		R	03	1mV	Same thing as above

0x101D	2	VCell7	unsigned int		R	03	1mV	Same thing as above
0x101E	2	VCell8	unsigned int		R	03	1mV	Same thing as above
0x101F	2	VCell9	unsigned int		R	03	1mV	Same thing as above
0x1020	2	VCell10	unsigned int		R	03	1mV	Same thing as above
0x1021	2	VCell11	unsigned int		R	03	1mV	Same thing as above
0x1022	2	VCell12	unsigned int		R	03	1mV	Same thing as above
0x1023	2	VCell13	unsigned int		R	03	1mV	Same thing as above
0x1024	2	VCell14	unsigned int		R	03	1mV	Same thing as above
0x1025	2	VCell15	unsigned int		R	03	1mV	Same thing as above
0x1026	2	VCell16	unsigned int		R	03	1mV	Same thing as above
0x1027	2	VCell17	unsigned int		R	03	1mV	Same thing as above
0x1028	2	VCell18	unsigned int		R	03	1mV	Same thing as above
0x1029	2	VCell19	unsigned int		R	03	1mV	Same thing as above
0x102A	2	VCell20	unsigned int		R	03	1mV	Same thing as above
0x102B	2	VCell21	unsigned int		R	03	1mV	Same thing as above
0x102C	2	VCell22	unsigned int		R	03	1mV	Same thing as above
0x102D	2	VCell23	unsigned int		R	03	1mV	Same thing as above
0x102E	2	VCell24	unsigned int		R	03	1mV	Same thing as above
0x102F	2	VCell25	unsigned int		R	03	1mV	Same thing as above
0x1030	2	VCell26	unsigned int		R	03	1mV	Same thing as above
0x1031	2	VCell27	unsigned int		R	03	1mV	Same thing as above
0x1032	2	VCell28	unsigned int		R	03	1mV	Same thing as above
0x1033	2	VCell29	unsigned int		R	03	1mV	Same thing as above
0x1034	2	VCell30	unsigned int		R	03	1mV	Same thing as above
0x1035	2	VCell31	unsigned int		R	03	1mV	Same thing as above
0x1036	2	VCell32	unsigned int		R	03	1mV	Same thing as above

二、03 function code read register

1. Command specific format (data is hexadecimal)

Addr		Fun	Reg start		Data		CRC16	
			REG Hi	REG Low	REG Hi	REG Low	REG Low	REG Hi
01H		03H	00H	00H	00H	06H	C5H	C8H
address		Function code	Register start address		Number of data read		Cyclic redundancy check code	

2. Read data instance

Use 03 function to read 1 to 3 series voltage of control board

Query data frame	01	03	10	18	00	03	81	0C			
Return to data frame	01	03	06	0C	AF	0C	AB	0C	AC	82	6C

Explain:

01: slave address

03: function code

06: hexadecimal, decimal is 6, which means there are 6 bytes of data after it

826c: cyclic redundancy check code

1st series voltage: 0x0caf * resolution Namely: 0x0caf * 0.001 = 3.247V

2nd series voltage: 0x0cab * resolution Namely: 0x0cab * 0.001 = 3.243V

3rd series voltage: 0x0cac * resolution Namely: 0x0cac * 0.001 = 3.244V

Protection reason definition table

Bit	7	6	5	4	3	2	1	0
High byte	NC	NC	NC	Discharge low temp protection	Discharge high temp protection	Charging low temp protection	High temp protection during charging	Unit cell undervoltage
Low byte	Unit cell overvoltage	Total voltage undervoltage	Total voltage overvoltage	Discharge overcurrent	Charging overcurrent	Discharge secondary overcurrent	Differential pressure protection	Short circuit protection

System status definition table PackStatus

Bit	7	6	5	4	3	2	1	0
High byte	NC	NC	NC	NC	NC	NC	NC	NC
Low byte	State of charge	Discharge state	NC	NC	NC	NC	Charge enable	Discharge enable