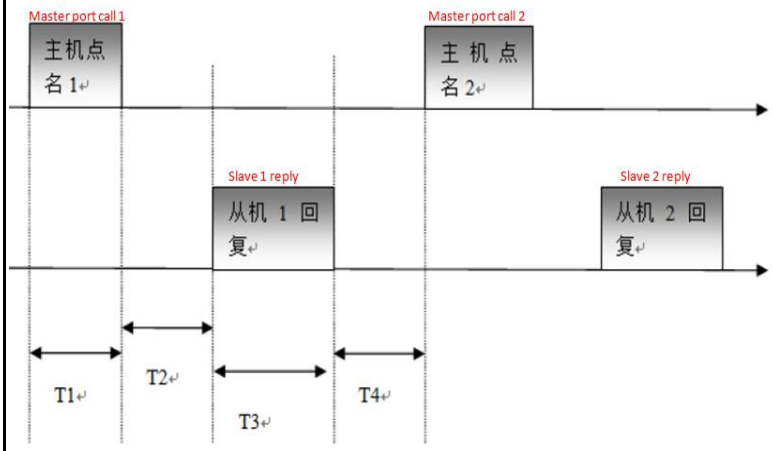
Data transmitted via UART	
Baut: 1200bps	
Transmission: RTU	
Start: LSB first	
Start bit: 1	
Data bit: 8	
Verification: None	
Stop bit: 1	

Software & Hardware
1.Standard Modbud-RTU, RS485 master cable, Master-slave half duplex asychronous serial communication;
2.Default communication setting : 1200-8-N-1; Low bit first, big edian in front, little edian afterwards;
3.Master port :External controller ; Modbus slave: Frequency converter ; Default slave address : AAH
4.This protocal supports the following 2 Modbus function codes for Modus xxxx
1). Function code C3H: Read multiple holding registers
2). Function code D0H: Write multiple holding registers
5. If Modbus slave can't connect to correct data for 15 seconds, communication error will be reported (not open considering compability), once correct data received,error will be eliminated

Communication Timing Procedure
1. Master port calls at a regular interval, interval:500ms [Calculation of duration: Master port callT1+Slave reply wait time T2+ Slave reply time T3)+T4]
2. Timing as follows :



3.Conditions:
1). Response time of Modbus slave (T2): Upon receipt of name frame from master port, Modbus slave has to send out first byte of response frame within 80ms
2). Sending time from master port (T4) :Upon receipt of last byte from reply frame, wait at least 50ms before sending out next data.
3). Timing is accounted by 1ms, maximum deviation is 1ms, a deviation of +/-1ms is acceptable by above mentioned timing conditions

Function Code	
0xC3	Description : Register reading Note: Master control board register reading, does not support broadcasting Function code: 0xC3 (user grade)

Table 8 Request Frame

Address	Function Code	Start Address	Reserved Data	CRC Verification Code
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes

Table 9 Response Frame

Address	Function Code	Error Code	Converter Operation	Pump Running Speed	CRC Verification Code
1 Byte	1 Byte	2 Bytes	1 Byte	2 Bytes	2 Bytes

0xD0	Description: Register writing Note: Write master board data into register, support broadcasting. Function code : 0xD0 (user grade)

Table 10 Request Frame

Address	Function Code	Start Address	Data	CRC Verification Code
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes

Table 11 Response Frame

Address	Function Code	Start Address	Reserved Data	CRC Verification Code
1 Byte	1 Byte	2 Bytes	3 Bytes	2 Bytes

Notes	1.Transmission format for "Start address","Data/Quantity" and "Valid Data" is the same, 8 big edian first,then 8 little edians. E.g.: To transmit 0x1234, Transmit 0x12 first, then 34 2. Transmission format for CRC verification code is :8 big edians first, then 8 little edians E.g.:To transmit 0xAA55, Transmit 0xAAfirst, then 0x55

Notion	Spec.Address	Attribution	Function	Data Type	Function Description	Remarks
Order to Master Control Board	3001	W	Setting RPM	INT16	1: OFF; 1200~2900: Valid RPM ; Other data not processed;	
	3002	W	Reservation	INT16	/	
Master Board Data Reading	2001	R	Error Code	INT16	Bit0	
					Bit1	
					Bit2	
					Bit3	
					Bit4	485 communication error with external control
					Bit5	Auto speed reduction against high temperature warning
					Bit6	Communication error between keypad and master control
					Bit7	EEPROM reading error
					Bit8	RTC time reading error
					Bit9	EEPROM master board
					Bit10	Current circuit error
					Bit11	Master drive error
					Bit12	Heat sink sensor error
					Bit13	Heat sink over heat
					Bit14	Output current exceeds limit
					Bit15	Input voltage abnormal
		R	Converter Operation State	INT8	Bit0	1: Pump On; 0: Pump Off;
					Bit1-bit7	Reservation
		R	Pump Running Speed	INT16	RPM value	/