VTS2000 Communication Protocol

(The following data are all hexadecimal)

1、RTU mode and format

When the controller communicates on the Modbus bus in RTU mode, each 8-bit byte in the information is divided into two 4-bit hexadecimal characters. The main advantage of this mode is that the density of characters transmitted is higher than that of ASCII mode at the same baud rate, each message must be transmitted continuously.

（1）The format of each byte in RTU mode

Coding system: 8-bit binary, hex 0-9, A-F.

Data bits: 1 start bit, 8 bits of data (lowest bit sent first), 1 stop bit, parity bit can be selected. (Refer to RTU data frame bit sequence diagram)

Error check area: cyclic redundancy check (CRC).

（2）RTU data frame bit sequence diagram

With Parity check

Start	1	2	3	4	5	6	7	8	Par	Stop

Without Parity check

Start	1	2	3	4	5	6	7	8	Stop

2、Reading and writing function code description：

Function code	**Function description**
03	Rea**d register**
06	Write register

3、 Register address

Register function	**Address**
control command input	2000H
Monitoring parameter reading（d-00～d-30）	1000H～001EH
MODBUS Frequency setting	2001H
User parameter settings（F0.00～F8.07）	0000H～0807H
Factory parameter setting（F9.00～F9.10）	0900H～090AH

4、Parameter address description of communication protocol：

Function Description	**Address definition**	**Explanation of data**	**R/W**

Communication control commands	2000H	0001H：Downtime	W
		0012H：Forward run	
		0013H：Jog forward	
		0022H：Reverse run	
		0023H：Jog reverse	
Communication frequency setting address	2001H	The communication frequency setting range is -10000 ~ 10000. Note: The communication frequency setting is a percentage relative to the maximum frequency, and its range is	W
Communication control commands	2002H	0001H：External fault input	W
		0002H：Fault reset	
Read run / stop	2102H	Set frequency (two decimal places)	R

parameters	2103H	Output frequency （two decimal places）	R
	2104H	Output current (one decimal places)	R
	2105H	Bus voltage (one decimal places)	R
	2106H	The output voltage(one decimal places)	R
	2107H	Analog input AI (two decimal places)	R
	2108H	Reserved	R
	2109H	current count value	R
	210AH	Motor speed	R
	210BH	Analog input AO (two decimal places)	R
	210CH	Reserved	R
	210DH	Inverter temperature (one decimal places)	R
	210EH	PID Feedback value （two decimal places）	R
	210FH	PID Given value （two decimal places）	R

	2110H	Reserved	R
	2111H	Reserved	R
	2112H	current failure	R
	2113H	current timing value	R
	2114H	Input terminal status	R
	2115H	Output terminal status	R
	2116H	BIT0: run/stop BIT1: Forward/Reverse BIT2: Jog BIT3: DC braking BIT4: reserved BIT5: Overvoltage Limit BIT6: Constant speed frequency reduction BIT7: Overcurrent Limit BIT8~9: 00-zero speed/01-acceleration/10-deceleration/11-uniform speed BIT10: Overload pre-alarm BIT11: reserved BIT12~13 running command channel: 00-panel/01-terminal/10-communication BIT14~15 busbar voltage status: 00-normal/01-low voltage protection/10-overvoltage protection	R

	2101H	Bit0：run Bit1：Downtime Bit2：Jog Bit3：Forward Bit4：Reverse Bit5～Bit7 reserved Bit8：Communication given Bit9：Analog signal input Bit10：Communication operation command channel Bit11： Parameter lock Bit12：Running Bit13：Jog command Bit14～Bit15： reserved	R

Read fault code description	2100H	00：No abnormality 01：Module failure 02：Overvoltage 03：Temperature failure 04：Inverter overload 05：Motor overload 06：External fault 07～09：Reserved 10：Overcurrent during acceleration 11：Overcurrent during deceleration 12：Overcurrent at constant speed 13：Reserved 14：Undervoltage 15：Reserved 16: RS485 communication failure 17: Burst tube failure 18: Reserved 19: Dual CPU communication failure 20: Reserved 21: Reserved 22: Current detection fault 23: Reserved 24: Reserved 25: Output phase loss	R

5、03H Reading function mode：

Inquiry information frame format (Send frame):

Address	01H
Function	03H
Starting data address	21H
	02H
Data(2Byte)	00H
	02H
CRC CHK Low	6FH
CRC CHK High	F7H

Data analysis：

01H Inverter address

03H Function code

2102H Starting

address

0002H To read the number of addresses, I.e. 2102H and

2103H F76FH 16-bit CRC check code

Response information frame format(Return frame):

Address	01H
Function	03H
DataNum*2	04H
Data1[2Byte]	17H
	70H
Data2[2Byte]	00H
	00H
CRC CHK Low	FEH
CRC CHK High	5CH

Data analysis：

01H Inverter address

03H Reading function code.

04H Is the product of reading items * 2

1770H Read the data of 2102H (set frequency)

0000H Read the data of 2103H (output

frequency) 5CFEH 16-bit CRC check code

6、06H Writing function mode

Inquiry information frame format(Sending frame):

Address	01H
Function	06H
Starting data address	20H
	00H
Data(2Byte)	00H
	01H
CRC CHK Low	43H
CRC CHK High	CAH

Data analysis：

01H Inverter address

06H Writing function code

2000H Control command

address 0001H Stop command

43CAH 16-bit CRC check code

Response information frame format(Return frame):

Address	01H
Function	06H
Starting data address	20H
	00H
Number of Data(Byte)	00H
	01H
CRC CHK Low	43H
CRC CHK High	CAH

Data analysis of this segment: If the settings are correct, return the same input data.