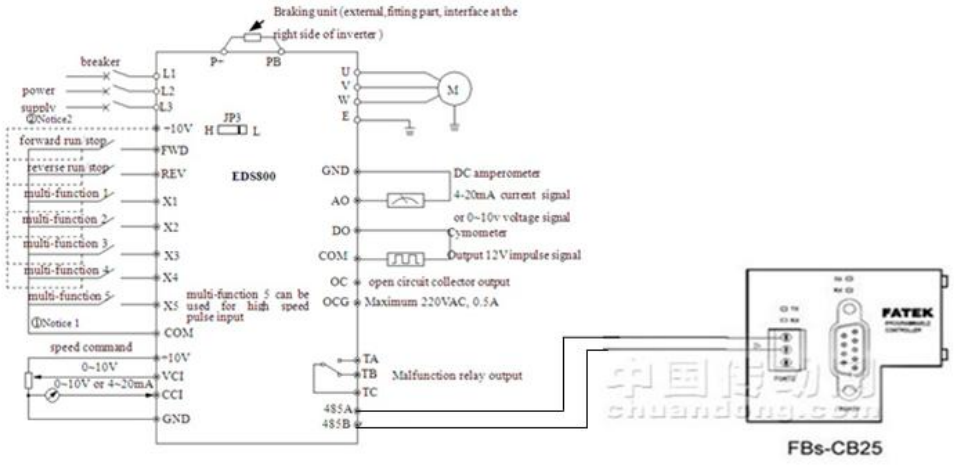
ENC Inverter & Fatek PLC Free Protocol Communication

1、Hardware connection

ENC inverter has one RS485 interface, which supports free protocol communication. So we need to choose free protocol communication via RS485 interface and CB25 communication board for Fatek PLC when we need to connect PLC communication. The wiring diagram is as shown in Figure 1.



2、Setting parameters for inverter

F0.00 frequency input channel selection-(03) serial port provision

F0.02 Run command channel selection-(03) serial port run command channel

F2.14 Communication configuration-(3) 9600BPS 1-8-1 format, even parity check

F2.15 Local address-(1) address is 1.

3、ENC inverter free communication protocol

main device command frame format																		
sending order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	frame head	auxiliary device address	auxiliary device address	main device command	main device command	assistant index	assistant index	command index	command index	set data	set data	set data	set data	checkout sum	checkout sum	checkout sum	checkout sum	frame end
Defi-nition	head	address		command area		Index area				setting data area				checkout area				end
sending byte	1	2		2		4				4				4				1

Figure 2 Host command frame format

auxiliary device response frame format																		
sending order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	frame head	auxiliary device address	auxiliary device address	auxiliary device reponse	auxiliary device reponse	failure index	failure index	command index	command index	run data	run data	run data	run data	checkout sum	checkout sum	checkout sum	checkout sum	frame end
Definiti-on	head	address		reponse area		Index area				Run data area				Checkout area				end
sending byte	1	2		2		4				4				4				1

Figure 3 Slave frame command format

3.2 Host command protocol

Name		main-frame order	auxi-liary index	order index	run data setting range	mainframe sending example, such as PC control operation of inverter(C language cluster format, auxiliary deviceaddress is set to 01)	run data precision	Descripti-on
look up auxiliary motor state		10	00	00	no	~010A00000192\r	1	
Read parameter of auxiliary motor	current set freq.	11	00	00	no	~010B00000193\r	0.01Hz	
	current run freq.	11	00	01	no	~010B00010194\r	0.01Hz	
	Output voltage	11	00	02	no	~010B00020195\r	1V	
	Output current	11	00	03	no	~010B00030196\r	0.1A	
	Bus-bar voltage	11	00	04	no	~010B00040197\r	1V	
	Load motor speed	11	00	05	no	~010B00050198\r	1rpm	
	Module temp.	11	00	06	no	~010B00060199\r	1°C	
	Runtime	11	00	07	no	~010B0007019A\r	1h	
	accumulative time	11	00	08	no	~010B0008019B\r	1h	
	Input terminal	11	00	09	no	~010B0009019C\r	no	
	output terminal	11	00	0A	no	~010B000A01A4\r	no	
	analog input VCI	11	00	0B	no	~010B000B01A5\r	0.01V	
	analog input CCI	11	00	0C	no	~010B000C01A6\r	0.01V	
	reserved	11	00	0D	no	~010B000D01A7\r	0.01V	
	exterior pulse input	11	00	0E	no	~010B000E01A8\r	0.01Hz	
	read inverter state	11	00	0F	no	~010B000F01A9\r	no	

4、PLC control requirement

In this control system, PLC is required to control forward, reversal, stop of the inverter and inputting frequency by touch screen.

Therefore, we compile the communication form based on host command frame format (Figure 2) and host command protocol table.

4.1 Forward running with frequency

(1) Protocol command

Auxiliary device Forward run with run freq. provision	12	00	05	0Hz~high limit freq.	~010C00050FA00280\r	0.01Hz	Forward run start Set freq.= 40.00Hz

(2) Convert to communication frame format

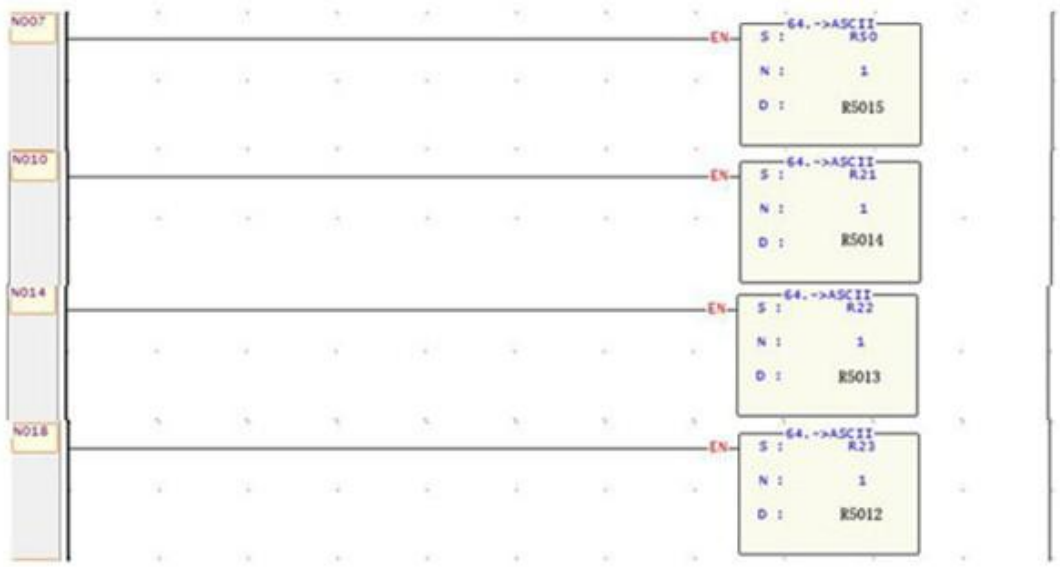
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	frame head	auxiliary device address	auxiliary device address	main device command	main device command	assistant index	assistant index	command index	command index	set data	set data	set data	set data	checkout sum	checkout sum	checkout sum	checkout sum	frame end
Hexadecimal format	7E	0	1	0	c	0	0	0	5	0	0	0	0	0	0	0	0	0D
ASCII code format	~	30H	31 H	30H	43H	30H	30H	30H	35H	30H	30H	30H	30H	30H	30H	30H	30H	' '
Corresponding PLC buffer	5003	5004	5005	5006	5007	5008	5009	5010	5011	5012	5013	5014	5015	5016	5017	5018	5019	5020

Note1 Note2

Note 1: The frequency to input in the data area is changeable. So the corresponding register is stored as zero in PLC.

The input frequency on the touch screen is stored in RO. Extract the number in RO by number 43 command. The process is as follows:

Convert the extracted number to ASCII code format by the FUN64 number command, and write into corresponding register. The process is as follows:



(4) Checksum calculation

Calculation method: The accumulating sum of ASCII code value of all bytes from slave address to operating data.

The process for calculating checksum is as follows:

Convert the number extracted from summation to ASCII code by FUN64 number command and store in the corresponding register. The process is as follows: