VFD-C2000 programmable multi-speed

Eden

Preface

Most of modern automation equipment use the PLC as the core doing the process control , and Delta new series inverter VFD-C2000 has build-in PLC with 10K steps , it make the application more flexible and save the cost and wiring .

The multi-speed function can be used in some application that need running with many different expect speed periodically , in following explanation will describe how to do in with build-in PLC .

Enable the PLC in C2000

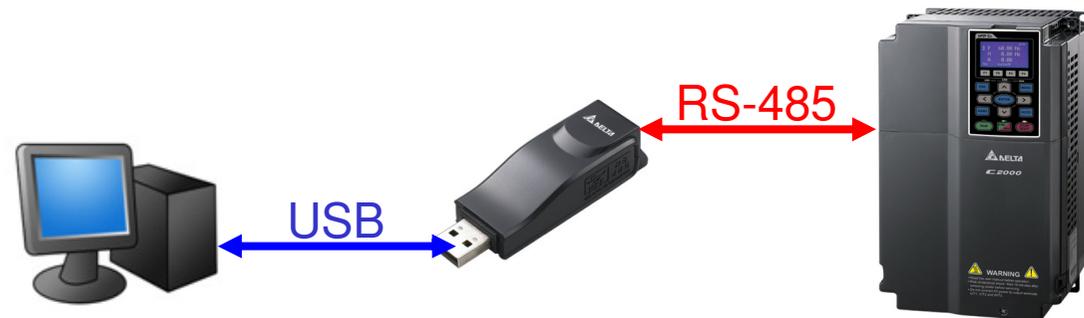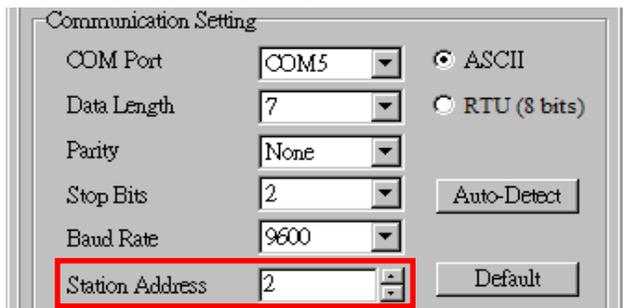Before using the PLC in C2000 , we have to enable it first :


```
Menu
  3:Keypad Lock
  4:PLC
  5:Copy PLC
```

Select PLC in menu


```
PLC
  1:Disable
  2:PLC Run
  3:PLC Stop
```

Select PLC run or PLC stop , if the PLC run is chosen then the status of PLC will be running every time when power on


```
           PLC/RUN      AUTO
  F    0.00 Hz
  H    0.00 Hz
  u  302.9 Vdc
JOG      18:47:16
```

The PLC status will show on the top of screen at the first page

Communicate with WPL software :

Cause the default station number of build-in PLC is 2 , so do not forget to setup the station number to 2 in WPL software , and the interface of VFD-C2000 is RS485 so we need a converter for it .
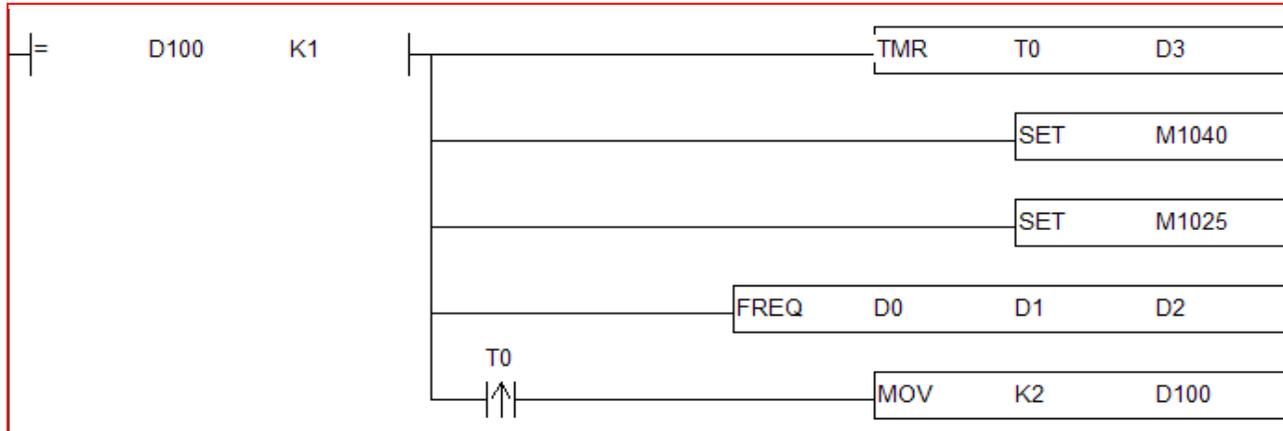

Communication Setting

COM Port	COM5	⊙ ASCII
Data Length	7	○ RTU (8 bits)
Parity	None	
Stop Bits	2	Auto-Detect
Baud Rate	9600	
Station Address	2	Default

RS-485

USB

PLC program

Below is the description for PLC program :

First step

=	D100	K1			TMR	T0	D3
					SET		M1040
					SET		M1025
				FREQ	D0	D1	D2
		T0 ↑		MOV	K2	D100

D0:Freq for 1st step(0.01Hz)

D1:Acc time for 1st step(0.01s)

D2:Dec time for 1st step(0.01s)

D3:Holding time for 1st step(0.1s)

Second step

=	D100	K2			TMR	T1	D7
					SET		M1040
					SET		M1025
				FREQ	D4	D5	D6
		T1 ↑		MOV	K3	D100
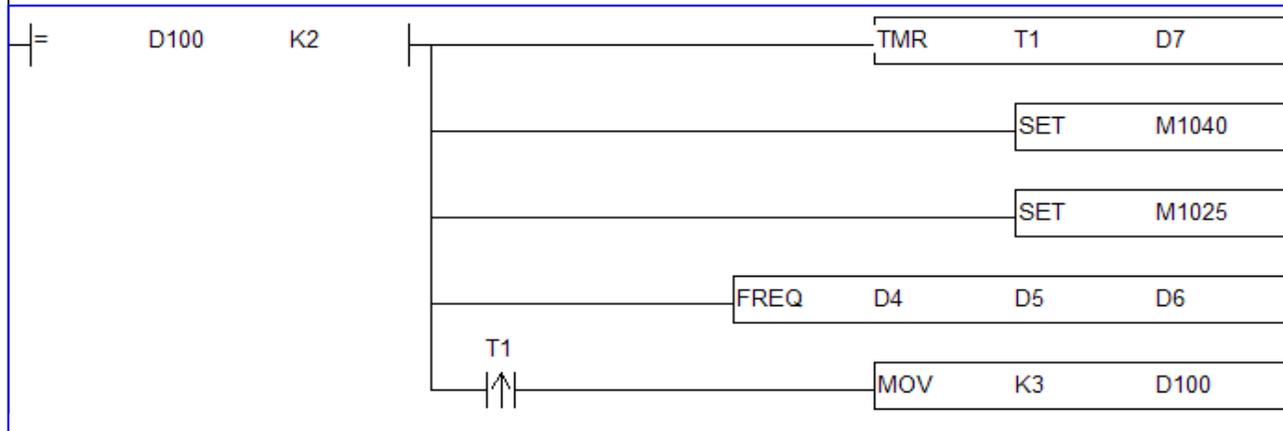
D4:Freq for 2nd step(0.01Hz)

D5:Acc time for 2nd step(0.01s)

D6:Dec time for 2nd step(0.01s)

D7:Holding time for 2nd step(0.1s)

The rest of program may be deduced by analogy , and the attached program is 8 steps .

P.S.The Acc/Dec time is decided by parameter 1-45 , the default is 0.01s

Running result

Run the attached program with below condition and the result is like below shows .

D0 = 1000 (10Hz)	D4 = 2000 (20Hz)	D8 = 3000 (30Hz)	D12 = 4000 (40Hz)
D1 = 10(0.1sec)	D5 = 10(0.1sec)	D9 = 10(0.1sec)	D13 = 10(0.1sec)
D2 = 10(0.1sec)	D6 = 10(0.1sec)	D10 = 10(0.1sec)	D14 = 10(0.1sec)
D3 = 20 (2sec)	D7 = 30 (3sec)	D11 = 40 (4sec)	D15 = 30 (3sec)
D16 = 3500 (35Hz)	D20 = 2500 (25Hz)	D24 = 1500 (15Hz)	D28 = 500 (5Hz)
D17 = 10(0.1sec)	D21 = 10(0.1sec)	D25 = 10(0.1sec)	D25 = 10(0.1sec)
D18 = 10(0.1sec)	D22 = 10(0.1sec)	D26= 10(0.1sec)	D26= 10(0.1sec)
D19 = 40 (4sec)	D23 = 30 (3sec)	D27 = 20 (2sec)	D31 = 10 (1sec)
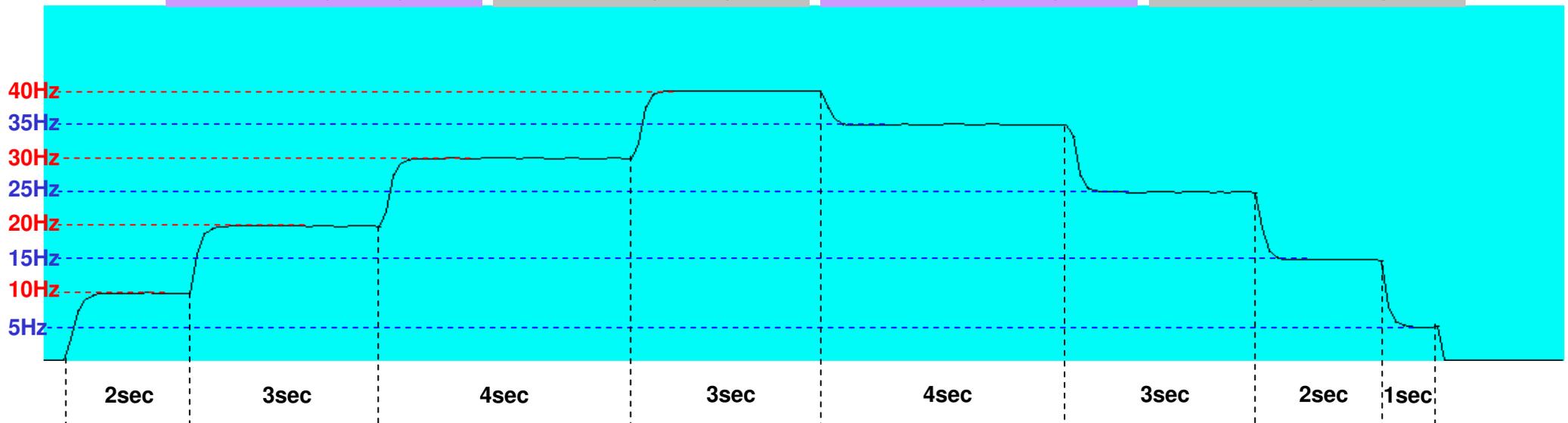
Run with power cut

Same condition with previous running but with power cut during the process , cause D0~D399 can hold the data while power down , so after the power is back , the program is able to continue the process like below shows .