Technical Announcement

IABU, DELTA ELECTRONICS, INC.

Product	DOP	**Models**	DOP-A Series	**Confidential level**	☑ General ☐ Classified ☐ Top secret
				ECN No.	N/A
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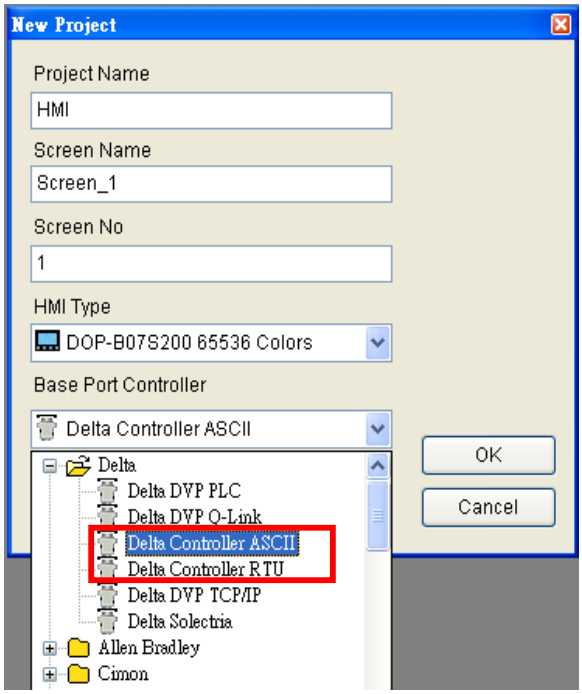
Purpose:

The communication setting for DOP-B connects with VFD-E.

Description:

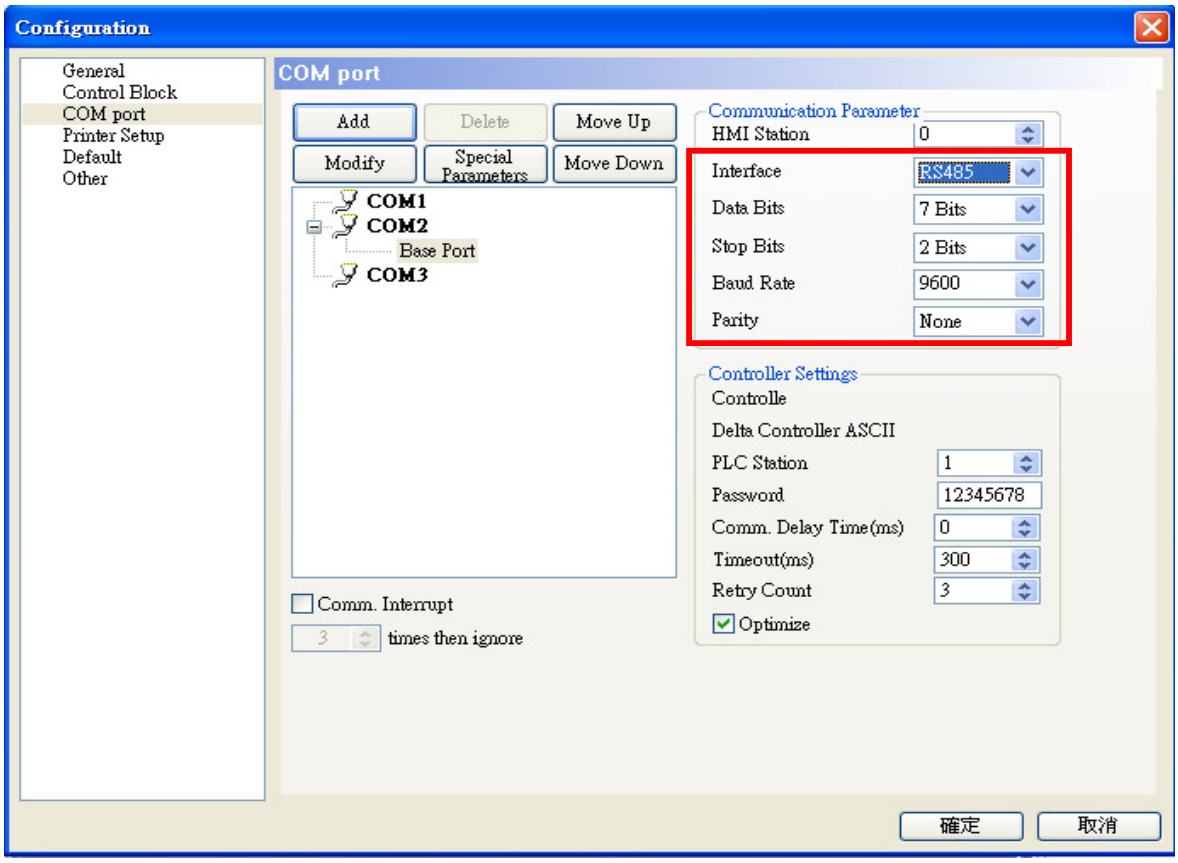
1. HMI Type：DOP-B
2. VFD Type：VFD-E
3. Communication Interface：RS-485

◎ DOP-B Type and Base Port Controller：



Use one of DOP-B type，the base port controller can be selected as Delta Controller ASCII or Delta Controller RTU。
DOP-B07S200 and Delta Controller ASCII were selected in this example。

◎ DOP-B Communication Setting：



◎ VFD-E Parameter Setting：

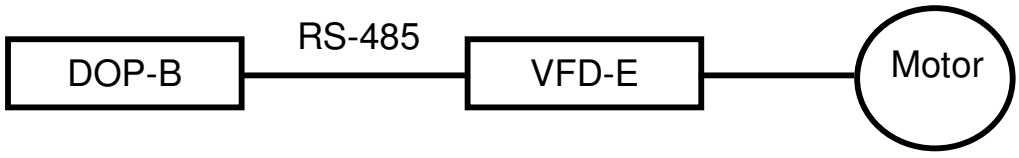
02.00 Source of First Master Frequency Command → **3**
02.01 Source of First Operation Command → **4**
09.00 Communication Address → **1**
09.01 Transmission Speed → **1**
09.04 Communication Protocol → **0**

＊ The Communication protocol of HMI and VFD must be the same，use 7, N, 2, 9600 in this example。

Parameter	Explanation	Settings	Factory Setting	Customer
✓02.00	Source of First Master Frequency Command	0: Digital keypad UP/DOWN keys or Multi-function Inputs UP/DOWN. Last used frequency saved. 1: 0 to +10V from AVI 2: 4 to 20mA from ACI or 0 to +10V from AVI2 3: RS-485 (RJ-45)/USB communication 4: Digital keypad potentiometer 5: CANopen communication	1	
✓02.01	Source of First Operation Command	0: Digital keypad 1: External terminals. Keypad STOP/RESET enabled. 2: External terminals. Keypad STOP/RESET disabled. 3: RS-485 (RJ-45)/USB communication. Keypad STOP/RESET enabled. 4: RS-485 (RJ-45)/USB communication. Keypad STOP/RESET disabled. 5: CANopen communication. Keypad STOP/RESET disabled.	1	

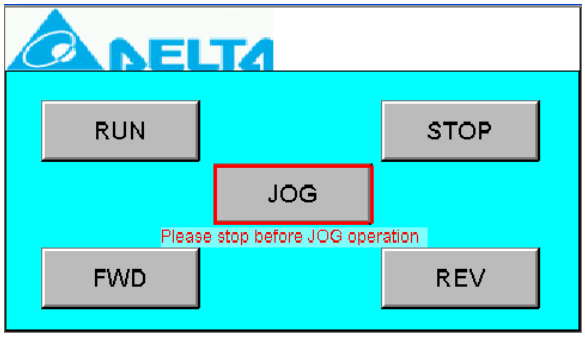
Parameter	Explanation	Settings	Factory Setting	Customer
✎09.00	Communication Address	1 to 254	1	
✎09.01	Transmission Speed	0: Baud rate 4800bps 1: Baud rate 9600bps 2: Baud rate 19200bps 3: Baud rate 38400bps	1	
✎09.04	Communication Protocol	0: 7,N,2 (Modbus, ASCII) 1: 7,E,1 (Modbus, ASCII) 2: 7,O,1 (Modbus, ASCII) 3: 8,N,2 (Modbus, RTU) 4: 8,E,1 (Modbus, RTU) 5: 8,O,1 (Modbus, RTU) 6: 8,N,1 (Modbus, RTU) 7: 8,E,2 (Modbus, RTU) 8: 8,O,2 (Modbus, RTU) 9: 7,N,1 (Modbus, ASCII) 10: 7,E,2 (Modbus, ASCII) 11: 7,O,2 (Modbus, ASCII)	0	

◎ The Connection with DOP-B and VFD-E：



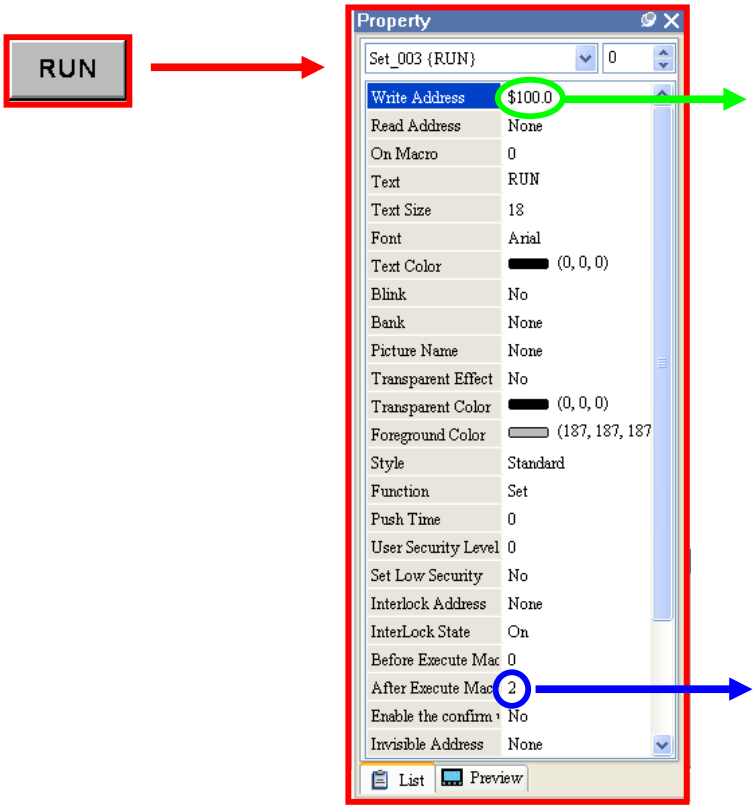
◎ DOP-B Object Setting：

User can control VFD to RUN、STOP、FWD、REV、and JOG via HMI。



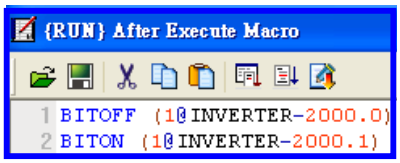
Content	Address	Function	
AC drive Parameters	GGnnH	GG means parameter group, nn means parameter number, for example, the address of Pr 04.01 is 0401H. Refer to chapter 5 for the function of each parameter. When reading parameter by command code 03H, only one parameter can be read at one time.	
Command Write only	2000H	Bit 0-1	00B: No function 01B: Stop 10B: Run 11B: Jog + Run
		Bit 2-3	Reserved
		Bit 4-5	00B: No function 01B: FWD 10B: REV 11B: Change direction

◆ RUN Property Setting：

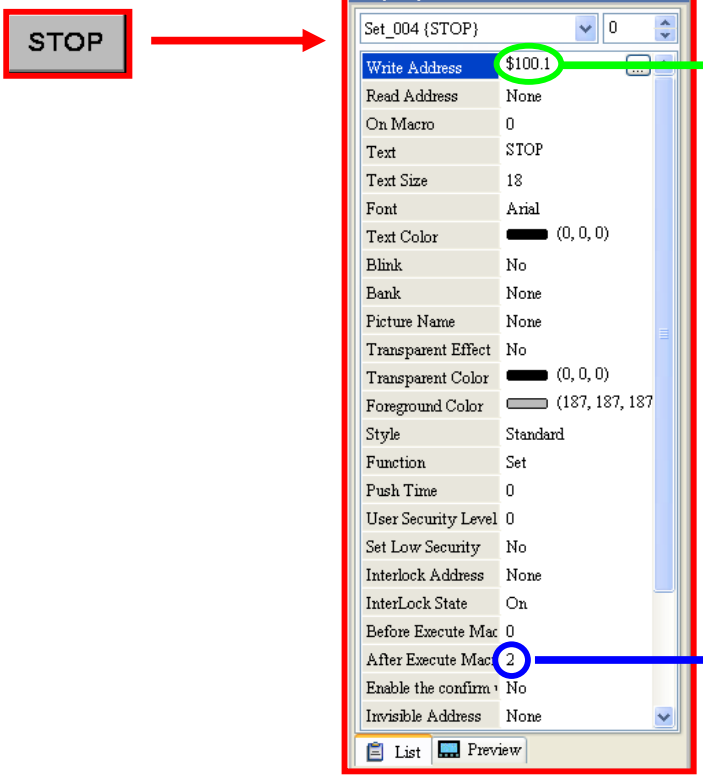


Set an Bit internal memory address $100.0 for example

Trigger 2000H Bit 0~1 status in macro 10B：RUN

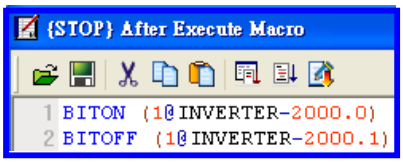


◆ STOP Property Setting：

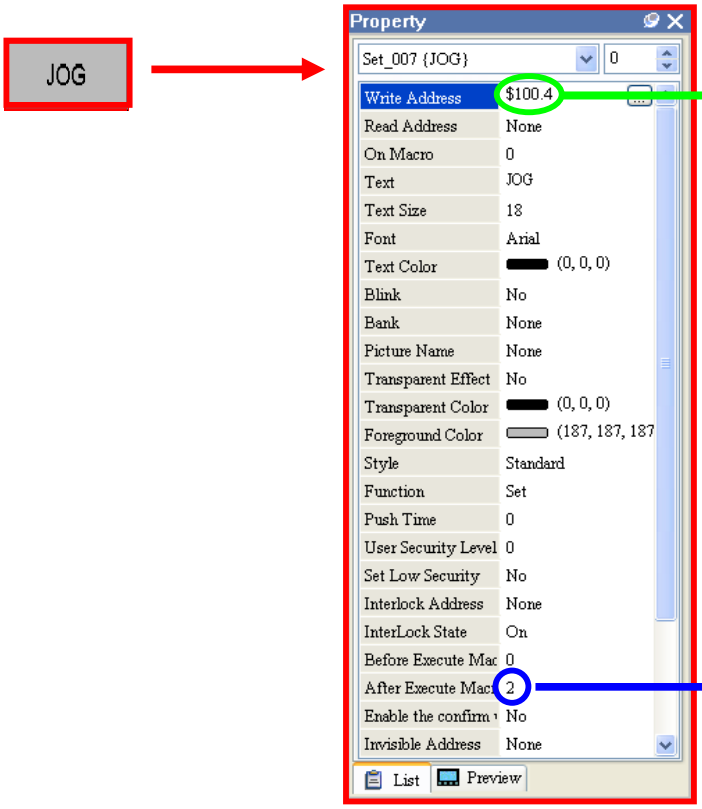


Set an Bit internal memory address $100.1 for example

Trigger 2000H Bit 0~1 status in macro
01B：STOP

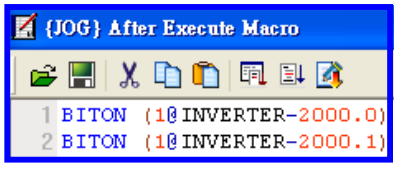


◆ JOG Property Setting：

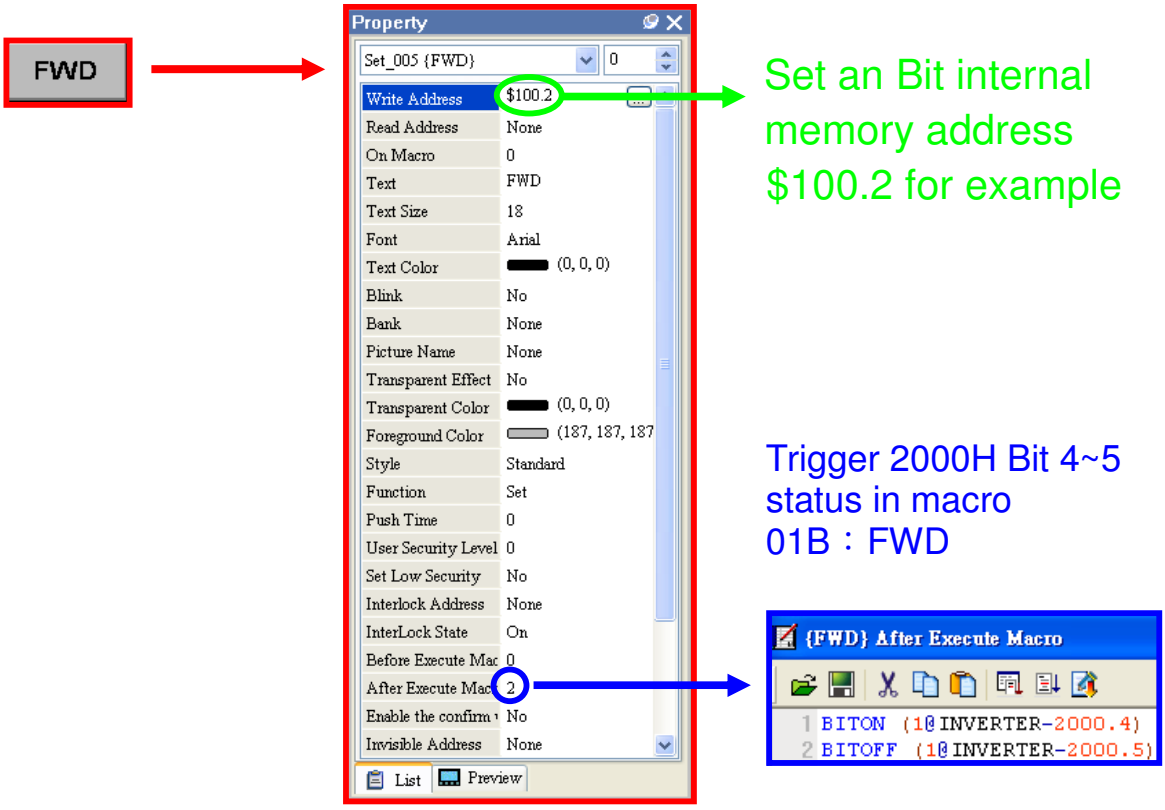


Set an Bit internal memory address $100.4 for example

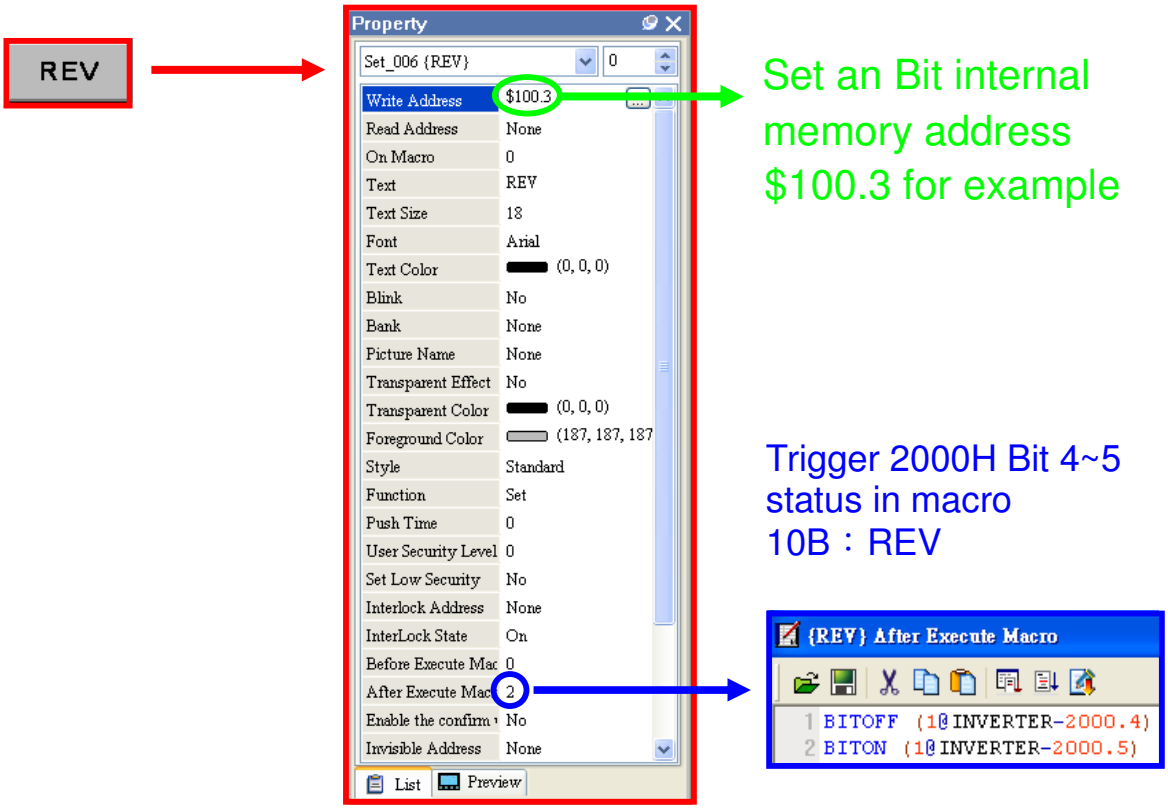
Trigger 2000H Bit 0~1 status in macro
11B：JOG



◆ FWD Property Setting：

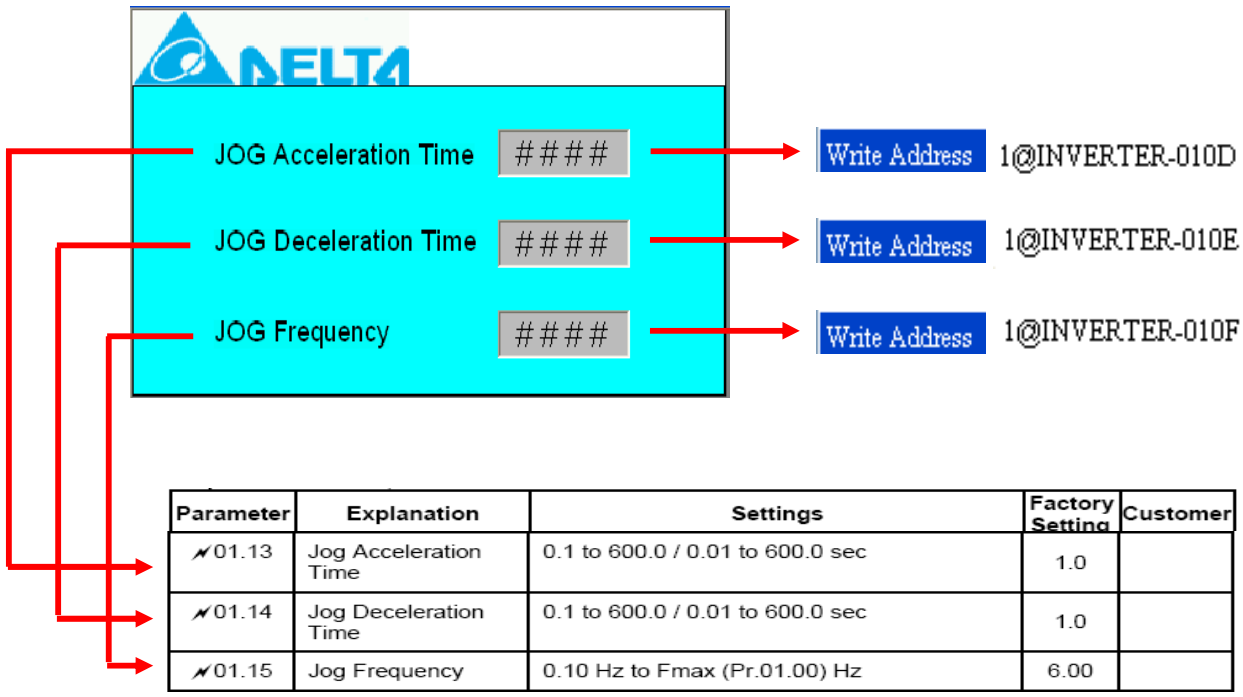


◆ REV Property Setting：



◎ DOP-B Object Setting：

Set the HEX address of inverter in Numeric Entry property to control JOG Acceleration Time、JOG Deceleration Time、and JOG Frequency。



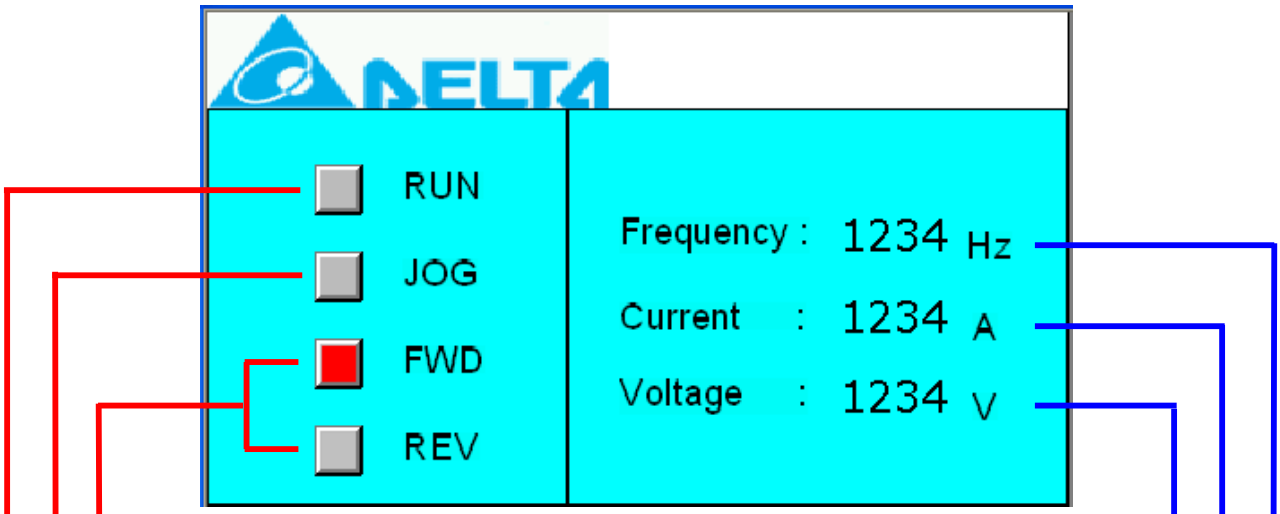
Parameter	Explanation	Settings	Factory Setting	Customer
01.13	Jog Acceleration Time	0.1 to 600.0 / 0.01 to 600.0 sec	1.0	
01.14	Jog Deceleration Time	0.1 to 600.0 / 0.01 to 600.0 sec	1.0	
01.15	Jog Frequency	0.10 Hz to Fmax (Pr.01.00) Hz	6.00	

Transfer the parameter to HEX address。

Pr.		HEX address
01.13	→	010D
01.14	→	010E
01.15	→	010F

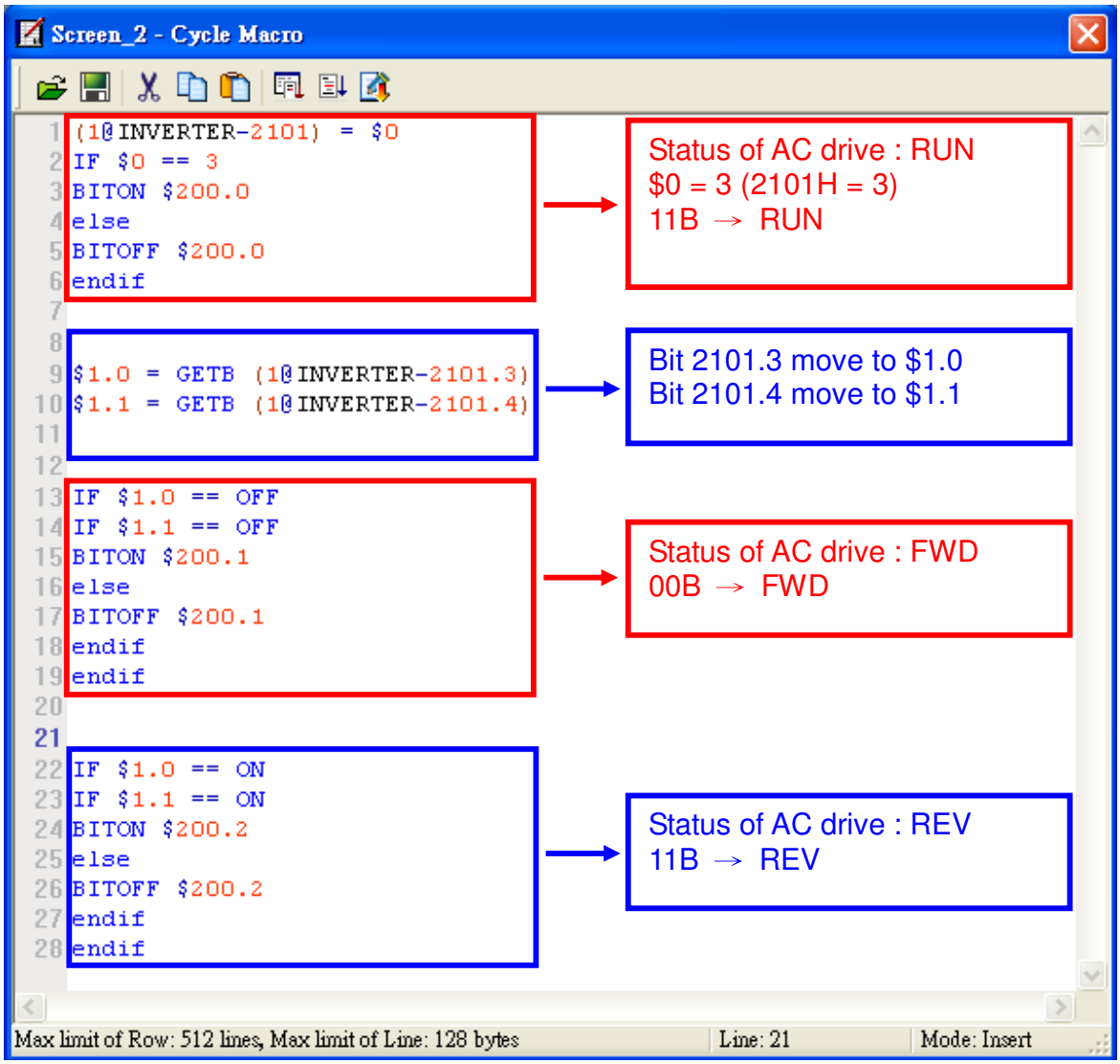
◎ DOP-B Object Setting：

To monitor the status of VFD from HMI，including operation status、JOG command、REV status、output frequency、output current and output voltage。



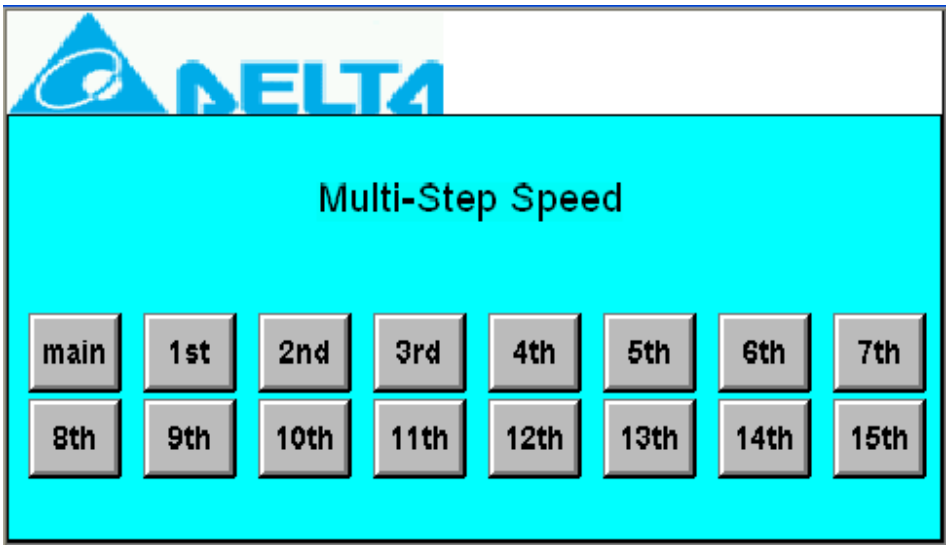
Status monitor Read only	2101H	Status of AC drive	
		Bit 0-1	00B: RUN LED is off, STOP LED is on (The AC motor Drive stops)
			01B: RUN LED blinks, STOP LED is on (When AC motor drive decelerates to stop)
			10B: RUN LED is on, STOP LED blinks (When AC motor drive is standby)
			11B: RUN LED is on, STOP LED is off (When AC motor drive runs)
		Bit 2	1: JOG command
		Bit 3-4	00B: FWD LED is on, REV LED is off (When AC motor drive runs forward)
			01B: FWD LED is on, REV LED blinks (When AC motor drive runs from reverse to forward)
			10B: FWD LED blinks, REV LED is on (When AC motor drive runs from forward to reverse)
			11B: FWD LED is off, REV LED is on (When AC motor drive runs reverse)
	2102H	Frequency command (F)	
	2103H	Output frequency (H)	
	2104H	Output current (AXXX.X)	
	2105H	Reserved	
	2106H	Reserved	
	2107H	Reserved	
	2108H	DC-BUS Voltage (UXXX.X)	
	2109H	Output voltage (EXXX.X)	

Edit the macro in Screen Cycle Macro，and use the bit of 2101H to monitor the status of AC drive。



◎ DOP-B Object Setting：

Send multi-step speed command from HMI to VFD，15 step speeds could be conducted through the digital statuses of the 4 terminals。



Parameter	Explanation	Settings	Factory Setting	Customer
04.05	Multi-function Input Terminal (MI3)	0: No function 1: Multi-Step speed command 1 2: Multi-Step speed command 2 3: Multi-Step speed command 3 4: Multi-Step speed command 4 5: External reset 6: Accel/Decel inhibit 7: Accel/Decel time selection command 8: Jog Operation 9: External base block 10: Up: Increment master frequency 11: Down: Decrement master frequency 12: Counter Trigger Signal 13: Counter reset 14: E.F. External Fault Input	1	
04.06	Multi-function Input Terminal (MI4)		2	
04.07	Multi-function Input Terminal (MI5)		3	
04.08	Multi-function Input Terminal (MI6)		4	

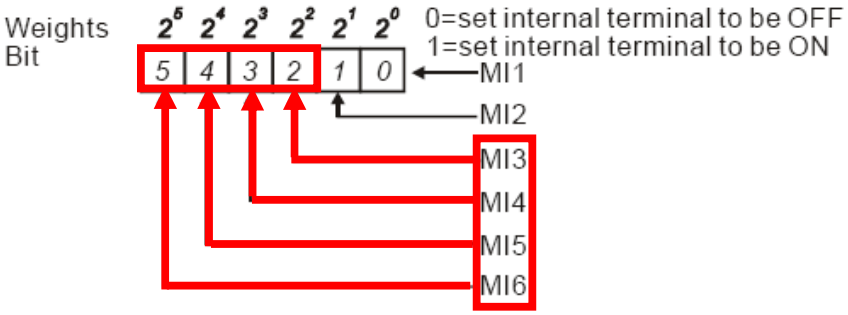
04.05	Multi-function Input Terminal (MI3)
	Factory Setting: 1
04.06	Multi-function Input Terminal (MI4)
	Factory Setting: 2
04.07	Multi-function Input Terminal (MI5)
	Factory Setting: 3
04.08	Multi-function Input Terminal (MI6)
	Factory Setting: 4

Settings	Function	Description
0	No Function	Any unused terminals should be programmed to 0 to insure they have no effect on operation.
1	Multi-Step Speed Command 1	These four inputs select the multi-speed defined by Pr.05.00 to Pr.05.14 as shown in the diagram at the end of this table. **NOTE: Pr.05.00 to Pr.05.14 can also be used to control output speed by programming the AC motor drive's internal PLC function. There are 17 step speed frequencies (including Master Frequency and Jog Frequency) to select for application.**
2	Multi-Step Speed Command 2	
3	Multi-Step Speed Command 3	
4	Multi-Step Speed Command 4	
5	External Reset	The External Reset has the same function as the Reset key on the Digital keypad. After faults such as O.H., O.C. and O.V. are cleared this input can be used to reset the drive.

04.28	Internal Terminal Status	Unit: 1
Settings	0 to 4095	Factory Setting: 0

This parameter is used to set the internal terminal action via keypad(optional), communication or PLC.

For standard AC motor drive (without extension card), the multi-function input terminals are MI1 to MI6 as shown in the following.



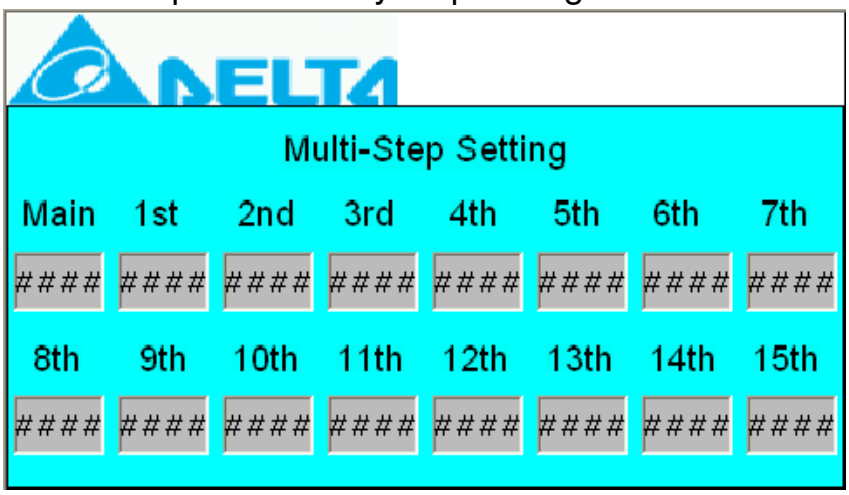
Change the status of bit2 - bit5 to set the multi-step speed command，and trigger the different bit status which wrote in the macro of button。

Parameter 04.28 transfer to HEX address 041C

	MI4 041C.5	MI3 041C.4	MI2 041C.3	MI1 041C.2
Main	**0**	**0**	**0**	**0**
1st	**0**	**0**	**0**	**1**
2nd	**0**	**0**	**1**	**0**
3rd	**0**	**0**	**1**	**1**
4th	**0**	**1**	**0**	**0**
5th	**0**	**1**	**0**	**1**
6th	**0**	**1**	**1**	**0**
7th	**0**	**1**	**1**	**1**
8th	**1**	**0**	**0**	**0**
9th	**1**	**0**	**0**	**1**
10th	**1**	**0**	**1**	**0**
11th	**1**	**0**	**1**	**1**
12th	**1**	**1**	**0**	**0**
13th	**1**	**1**	**0**	**1**
14th	**1**	**1**	**1**	**0**
15th	**1**	**1**	**1**	**1**

◎ DOP-B Object Setting：

User can set the speed of every step through HEX address of VFD。



Address	Function
2001H	Frequency command

Step	Address
Main	2001

Parameter	Explanation
05.00	1st Step Speed Frequency
05.01	2nd Step Speed Frequency
05.02	3rd Step Speed Frequency
05.03	4th Step Speed Frequency
05.04	5th Step Speed Frequency
05.05	6th Step Speed Frequency
05.06	7th Step Speed Frequency
05.07	8th Step Speed Frequency
05.08	9th Step Speed Frequency
05.09	10th Step Speed Frequency
05.10	11th Step Speed Frequency
05.11	12th Step Speed Frequency
05.12	13th Step Speed Frequency
05.13	14th Step Speed Frequency
05.14	15th Step Speed Frequency

Step	Address
1st	0500
2nd	0501
3rd	0502
4th	0503
5th	0504
6th	0505
7th	0506
8th	0507
9th	0508
10th	0509
11th	050A
12th	050B
13th	050C
14th	050D
15th	050E