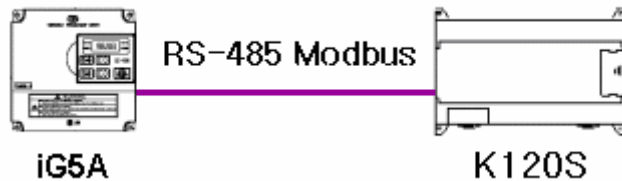


K120S and iG5A (VFD): Modbus RTU protocol

This is a communication example to use RS-485 (channel 1) of K120S as master in Modbus RTU protocol to communicate to iG5A.

(1) System configuration



(2) Parameter setting

2.1 iG5A setting

Basic parameter setting is required as follows:

I/O 59 [communication protocol]: 0 [Modbus RTU]

I/O 60 [VFD station number]: 1

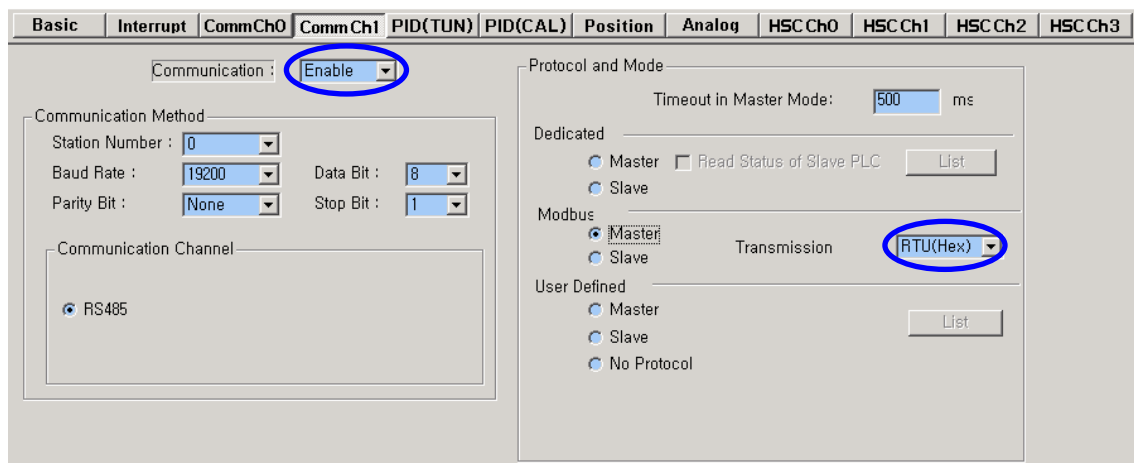
I/O 61 [communication speed]: 4 (19200bps)

2.2 K120S setting

As you see in the following, do the parameter setting in Ch1 and make it 'Enabled'.

Station number: 0, Baud rate: 19200, Data bit: 8, Stop bit: 1, Parity bit: none

Modbus: master and transmission mode is RTU (Hex).



(3) Modbus communication program

3.1 Write enable

Now look at iG5A address. As you see in the following, you are supposed to put 1 in 0004 address of iG5A in order to make 'Write Enable'.

< Common >

Parameter address	Description	Unit	Read/Write	Data value (HEX)	Note
0000	Inverter model	-	R	7: SV-iG5	
0001	Inverter capacity	-	R	0: 0.5Hp, 1: 1Hp, 2: 2Hp 3: 3Hp, 4:5Hp, 5: 5.4Hp	
0002	Inverter input voltage	-	R	0: 220V class, 1:440V class	
0003	Version	-	R	313043: Version 1.0C 353043: Version 5.0C	
0004	Parameter write enable	-	R/W	0: Write disable (default) 1: Write enable	

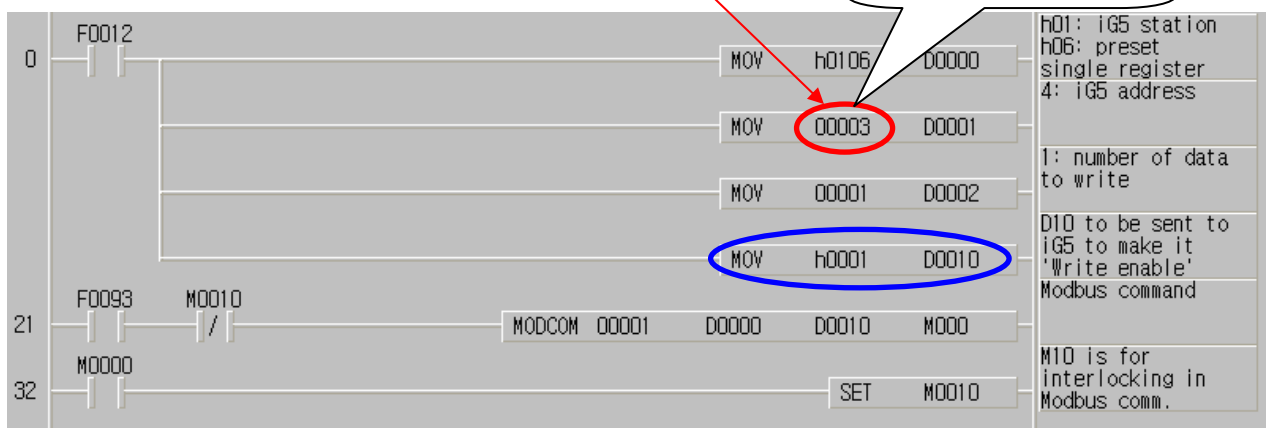
There is no 0 in Modbus address. To set 0004 of iG5A, write data to 0003 (Actual address - 1).

Let's see Modbus communication command of K120S (page: 8-62).

Input Condition	MODBUS Communication Channel	SND/RCV Parameter	SND/RCV Data	Status	
	MODCOM	Ch	S1	S2	S3

Flag	Designation
Error (F110)	Error flag turns on when designating area is over and the instruction isn't executed
	Ch: Designated communication channel
	S1: Device which is registered communication parameter
	S2: Device which stored communication data
	S3: Device which stored communication status

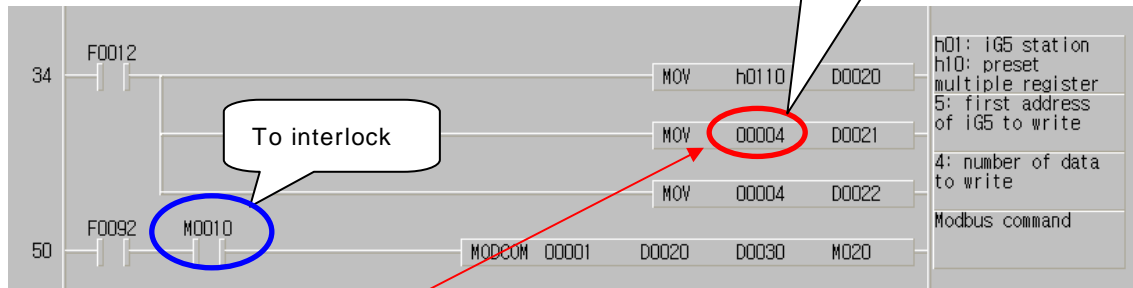
This program is to make iG5A enabled to write.



* Note that [MOV h0001 D0010] is used to make iG5A enabled to write, which means you are supposed to send 1 in address 4 of iG5A using MODCOM command.

* [SET M0010] in 32 rung is to interlock MODCOM command to read/write the actual data.

3.2 Write data



Note: [MOV h0110 D0020] in rung 34, the upper byte of h0110 (h01) means iG5A station number and the lower byte of h0110 (h10 = 16) is Modbus function code (16) which means preset multiple registers because we write 4 register from 5 to 8 as follows:

0005	Reference frequency	0.01 Hz	R/W	
0006	Operation reference	-	R/W	Bit 0: Stop (R/W) Bit 1: Forward (R/W) Bit 2: Reverse (R/W) Bit 3: Fault reset (W) Bit 4: Emergency stop (W)
0007	Accel time	0.1 sec	R/W	
0008	Decel time	0.1 sec	R/W	

The data to write are set from D0030 to D0031.

D0030: Reference frequency

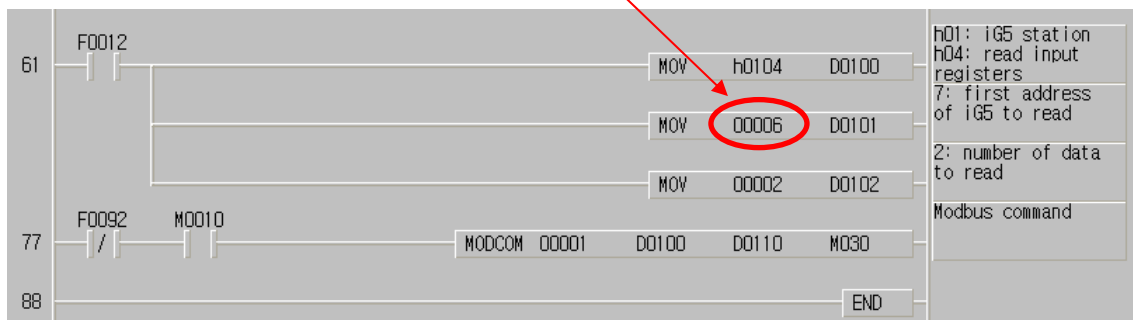
D0031: Operation reference

D0032: Acceleration time

D0033: Deceleration time

3.3 Read data

Here for the test, we are to read acceleration time and deceleration time which we set in the previous Modbus command.



D0110: Acceleration time to be read by MODCOM

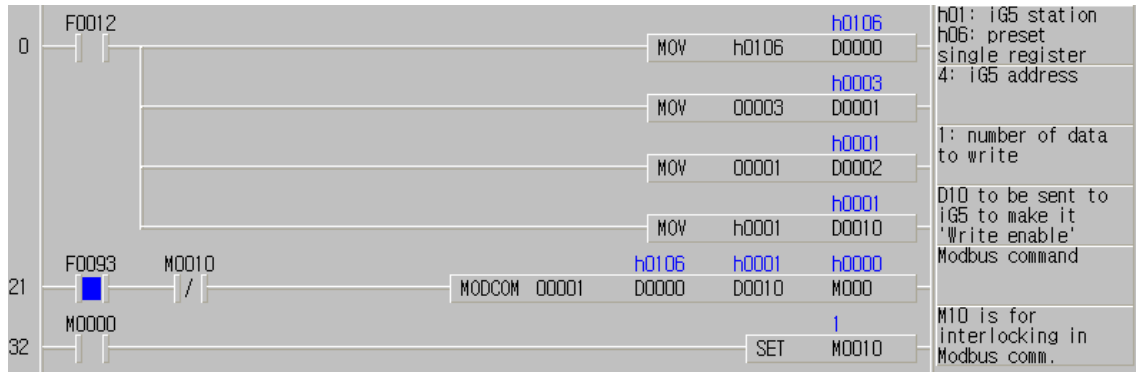
D0111: Deceleration time to be read by MODCOM

3.4 Modbus function code

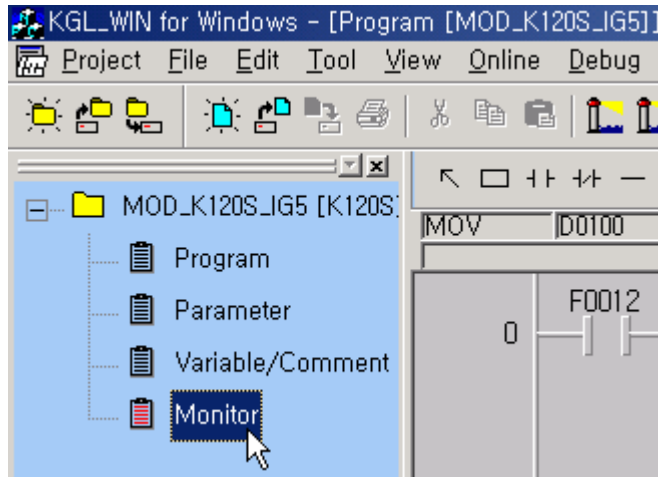
Code	Function code name	Modicon PLC Data address	Remark
01	Read Coil Status	0XXXX(bit-output)	Read bits
02	Read Input Status	1XXXX(bit-input)	Read bits
03	Read Holding Registers	4XXXX(word-output)	Read words
04	Read Input Registers	3XXXX(word-input)	Read words
05	Force Single Coil	0XXXX(bit-output)	Write bit
06	Preset Single Register	4XXXX(word-output)	Write word
15	Force Multiple Coils	0XXXX(bit-output)	Write bits
16	Preset Multiple Registers	4XXXX(word-output)	Write words

(4) Program monitor

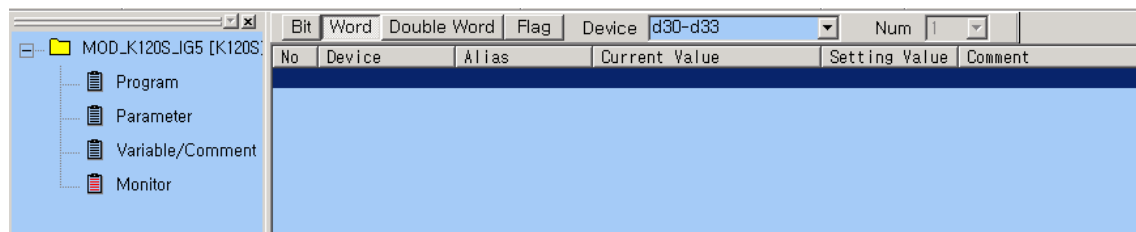
4.1 Write enabled



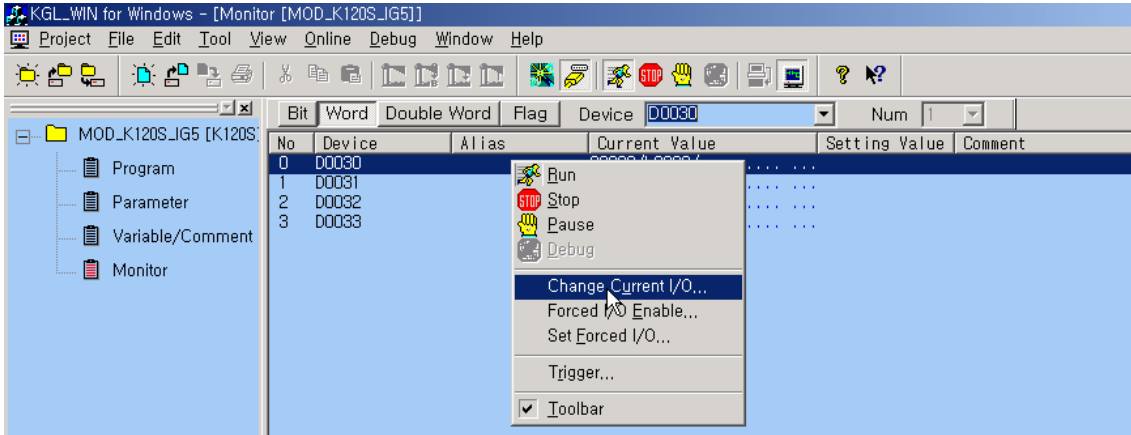
4.2. In the project window, click 'Monitor' to change current I/O value and monitor.



4.3 Click 'Word' and type D30-D33 and press ENTER.

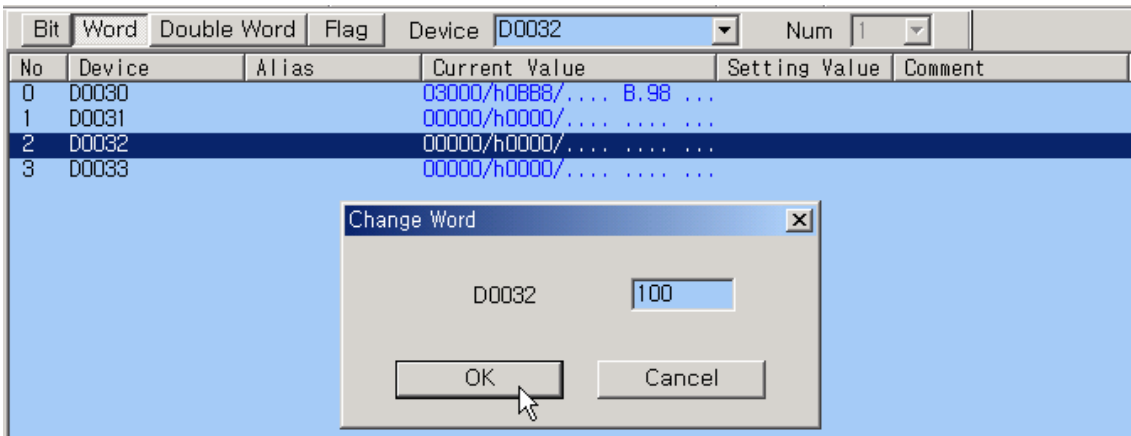


4.4 Then you will see the next window. Select D0 and right-mouse click, which will pop up a window as follows:

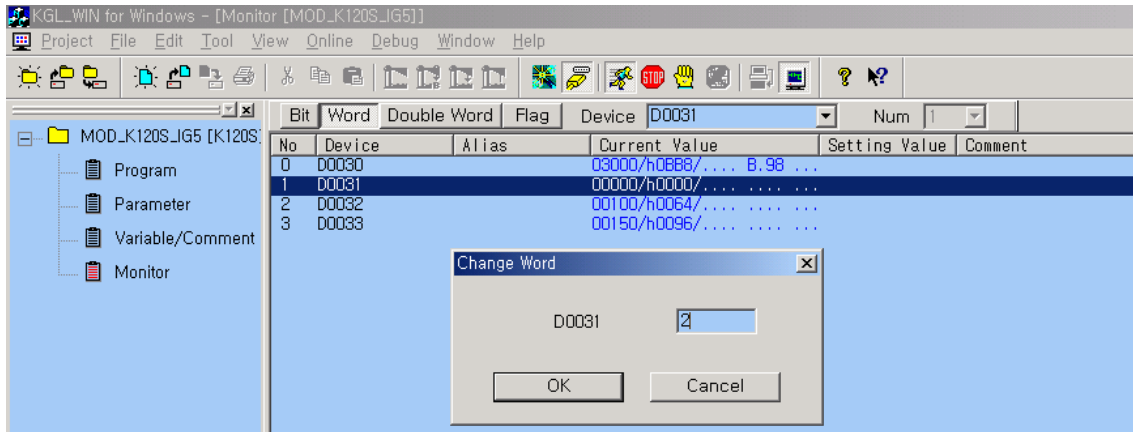
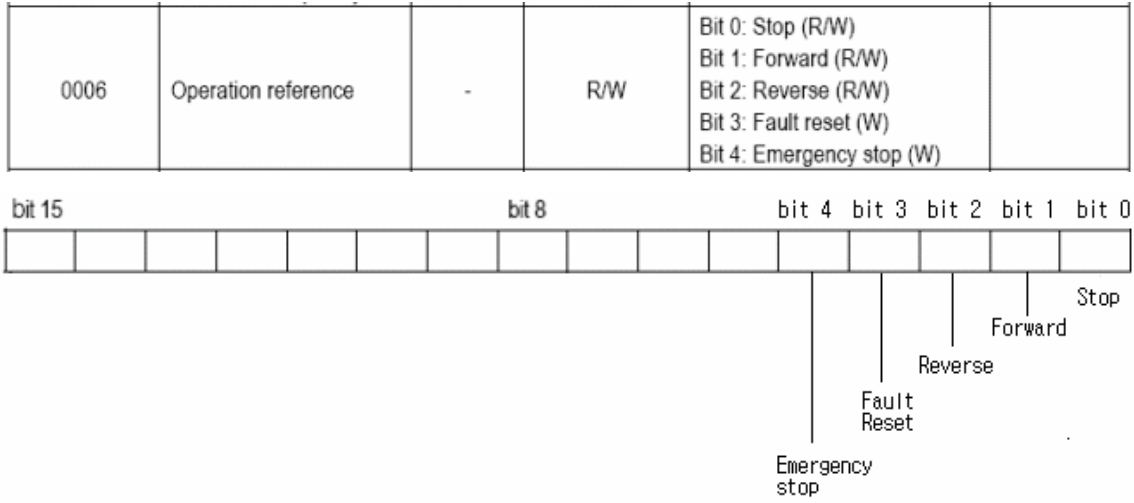


Select 'Change Current I/O' and type 3000 and see the iG5A change.

4.5 Then put 100 in D0032 and put 150 in D0033 as follows:

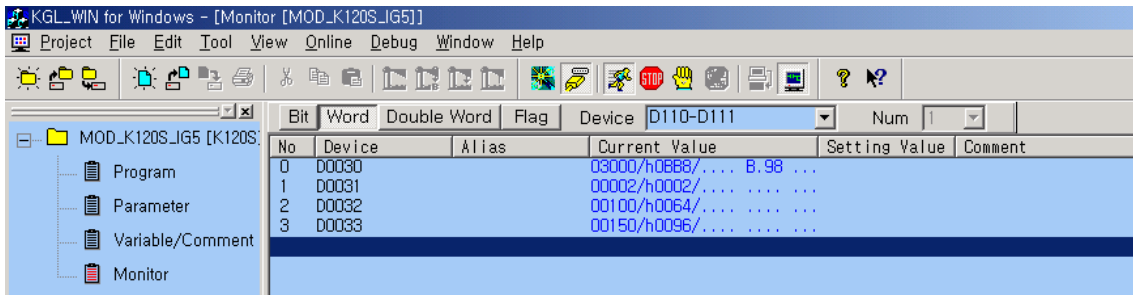


4.6 Now put 2 in D0031 which turns on bit 1 of address 6 of iG5A, which means 'Forward Run'.

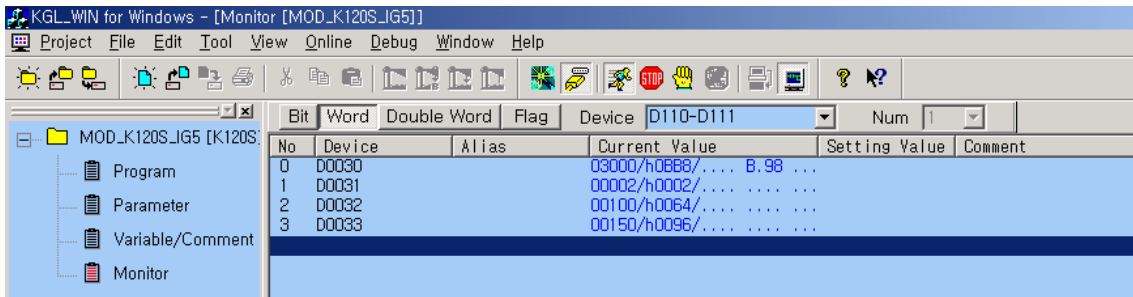


If you put 2 in D0031, it means 'Forward Run'. If you put 4 in D0031, it is 'Reverse Run'.

4.7 Add D110 and D111 in monitor list.

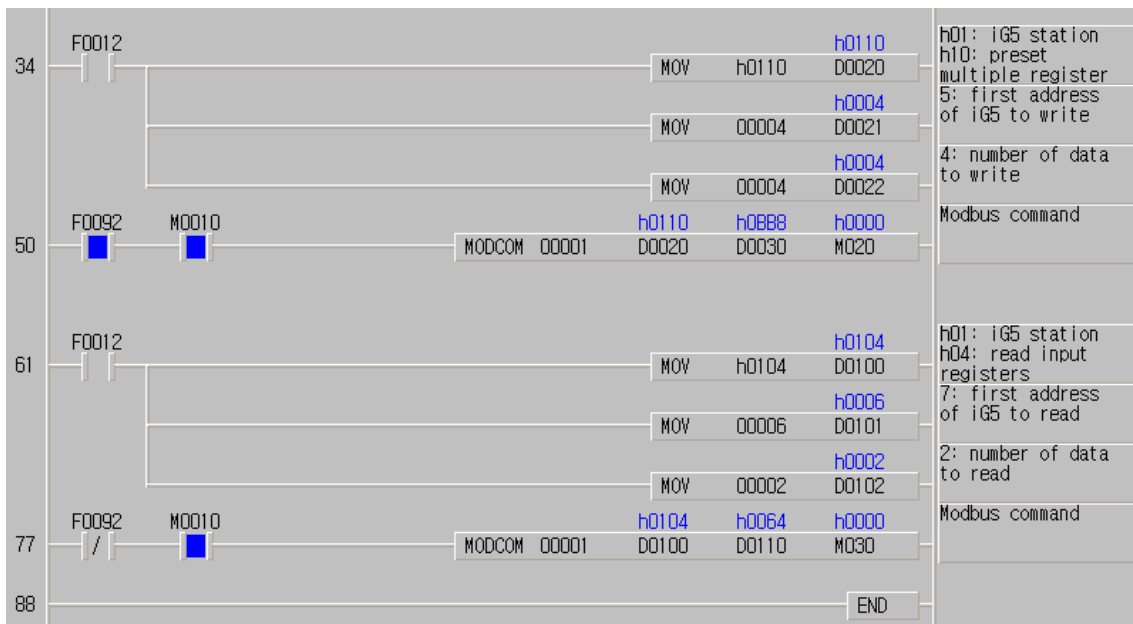


You will see the current acceleration and deceleration time of iG5A as below.



No	Device	Alias	Current Value	Setting Value
0	D0030		03000/h0888/.... B.98 7.54 3.../'?'	
1	D0031		00002/h0002/....	
2	D0032		00100/h0064/.... .65. .2../'d'	
3	D0033		00150/h0096/.... 7..4 .21../'?'	
4	D0110		00100/h0064/.... .65. .2../'d'	
5	D0111		00150/h0096/.... 7..4 .21../'?'	

4.8 Write and read monitor.



You are able to change F93 in rung 50 and 77 to F92.