

☆☆☆ Write the Ladder program and Registers into Flash directly

- The OS version V3.50 or later provides the function to write ladder program and data registers into Flash ROM (the Flash ROM must be placed at the user program socket built in CPU board) directly ; it is not necessary to write the Flash ROM via FP-07B.

For long term saving and easy maintenance are the obvious advantages to write the ladder program and data registers into Flash ROM ◦

- To operate friendly , Win-Proladder supports the corresponding Flash ROM operation ; but for general usage , the direct registers access method is introduced first as followings :

- R4051 : Type of Flash ROM

- R4051=0 , Flash ROM : W29EE011,W29C011A (Winbond)  
AT29C010 (Atmel)
- R4051=1 , Flash ROM : AT49F010 (Atmel)

- R4052 : Modify & Test mode or Write the Flash command or Status of Flash writing

- R4052=5530H , Modify & Test mode ;

There are 2 kinds of memory on CPU board to store the ladder program and data registers ; one is the battery backup RAM , this is standard equipment and all ladder program and data register must be executed here ; another memory to store the ladder program and data registers is the Flash ROM·EEPROM or EPROM , which is optional and must be placed at the user's program socket built in CPU board , the ladder program and data registers can't be executed here directly.

In Modify & Test mode , the ladder program and data registers storing in battery backup RAM of CPU will not be overwritten by the ladder program and data registers storing in the Flash ROM when power up ;

It means the content of battery backup RAM will be kept , and the modification will not be lost , this is so called "Modify & Test mode" ◦

After the modification and testing has been finished , copying the ladder program and data registers into the Flash ROM is a better way for long term saving and easy maintenance ◦

During the modification and testing , if the user want to give up the change , it is only to set R4052 to be 0 , and turn off then turn on the power again , the ladder program and data registers storing in battery backup RAM will be overwritten by which storing in the Flash ROM when power up ◦

- = The other values except 5550h & 5560h ;

Every power on , the ladder program and been assigned data registers storing in battery backup RAM will be replaced by which storing in the Flash ROM (if this Flash ROM had ever been written the ladder program into and been placed at the user's program socket) , and the PLC will be in "RUN" mode automatically regardless it's "RUN" or "STOP" mode before ◦

- When PLC in "STOP" mode , the user may give the command to clear Flash ROM or write ladder program and been assigned registers into Falsh ROM.
  - R4052=5550H , giving the command to clear Fash ROM
  - R4052=5551H , the status to say " Flash ROM being cleared"
  - R4052=5552H , the status to say "verify for clearing"
  - R4052=5553H , the status to say "Complete the clearing of Flash ROM"
  - R4052=5554H , the status to say "Failed to clear the Flash ROM"
  
  - R4052=5560H , giving the command to write ladder program and been assigned registers into Falsh ROM
  - R4052=5561H , the status to say " Flash ROM being cleared" (AT49F010)
  - R4052=5562H , the status to say "Writing the Ladder Program"
  - R4052=5563H , the status to say "Writing the Rxxxx Register"
  - R4052=5564H , the status to say "Writing the Dxxxx Register"
  - R4052=5565H , the status to say "Writing the Special Register"
  - R4052=5566H , the status to say "Verify the Ladder Program"
  - R4052=5567H , the status to say "Verify the Rxxxx Register"
  - R4052=5568H , the status to say "Verify the Dxxxx Register"
  - R4052=5569H , the status to say "Verify the Special Register"
  - R4052=556AH , the status to say "Complete the writing of ladder program & been assigned registers"
  - R4052=556BH , the status to say "Failed to write ladder program"
  - R4052=556CH , the status to say "Failed to write registers"

☆☆☆ Assign the Registers to be written into the Flash ROM

- The contents of the registers may be written into the Flash ROM and which will be read back to initialize the corresponding working registers being executed at every power on. The tuning value or fixed preset value may be written into the Flash ROM for this kind of application to keep proper operation even the loss of the battery power ◦
- The special registers of R4030~R4043 are used to assign which group of registers needed to be written into Flash ROM for above mentioned application ; it is necessary to do the assignment first before giving command to write the Flash ROM ◦
  - R4030=A66Ah , it is the identification flag to tell the registers needed be written into and read-back from the Flash ROM according to the following settings of R4031~R4043 (Retentive registers support this function) ;
    - = The other values , there is not any register needed be written into and read-back from the Flash ROM ◦
  - R4031=Quantity of register groups needed be written into and read-back from the Flash ROM (6 in maximum)
  - R4032=Length 0 , the data length of register group 0
    - The valid length is between 1 ~ 3840 for register R0 ~ R3839 ;
    - The valid length is between 1 ~ 3072 for register R5000 ~ R8071 ;
    - The valid length is between 1 ~ 3072 for register D0 ~ D3071 ;
    - The valid length is between 1 ~ 166 for register R4000 ~ R4165 ;
    - It will not work when illegal length or out of range ;
  - R4033= Start 0 , the starting address of of register group 0
    - The valid address is between 0 ~ 3839 for register R0 ~ R3839 ;
    - The valid address is between 5000 ~ 8071 for R5000 ~ R8071 ;
    - The valid address is between 10000 ~ 13071 for D0 ~ D3071 ;
    - (The address must be added by 10000 for register Dxxxx)
    - The valid address is between 4000 ~ 4165 for R4000 ~ R4165 ;
    - R4033 and R4032 are used in pair ◦
  - R4034= Length 1 , the data length of register group 1
    - The valid length same as mentioned above for R4032 ;
  - R4035= Start 1 , the starting address of of register group 1
    - The valid address same as mentioned above for R4033 ;
    - R4035 and R4034 are used in pair ◦
  - R4036= Length 2 , the data length of register group 2
    - The valid length same as mentioned above for R4032 ;
  - R4037= Start 2 , the starting address of of register group 2
    - The valid address same as mentioned above for R4033 ;
    - R4037 and R4036 are used in pair ◦

- R4038= Length 3 , the data length of register group 3  
The valid length same as mentioned above for R4032 ;
- R4039= Start 3 , the starting address of of register group 3  
The valid address same as mentioned above for R4033 ;  
R4039 and R4038 are used in pair ◦
- R4040= Length 4 , the data length of register group 4  
The valid length same as mentioned above for R4032 ;
- R4041= Start 4 , the starting address of of register group 4  
The valid address same as mentioned above for R4033 ;  
R4041 and R4040 are used in pair ◦
- R4042= Length 5 , the data length of register group 5  
The valid length same as mentioned above for R4032 ;
- R4043= Start 5 , the starting address of of register group 5  
The valid address same as mentioned above for R4033 ;  
R4043 and R4042 are used in pair ◦

## ☆☆☆ Writing ladder program & registers into Flash via Win-Proladder

- When on line connecting the PLC , Win-Proladder provides the user friendly interface for Flash ROM operation ; it is more easier and convenient for user to accomplish the Flash ROM manipulation ◦

Procedure as followings:

- Click "Tool" and select "Flash operations" , it comes the selective items :
  - Write program\_data to Flash
  - Erase Flash content
  - Disable FLASH loading when power on
  - Load FLASH content when power up

The user may select the item as required and detailed description as bellow :

- Click " Write program\_data to Flash " , then "Next" , it is showing

Please select the Flash model number

Manufacture	Part number	Index
Atmel	AT29C010	0
Atmel	AT49F010	1
Winbond	W29C011A	0
Winbond	W29EE011	0

Select the type of Flash ROM , then click "Next" , it is showing

Assign the data to be read back when power up

- If there is not any register needed to the written into and read-back from the the Flash ROM , click "Finish" , it is showing

Under programming, please wait...

It will show "Flash write OK" if this writing is successful.

It will show "Flash write error" if this writing is failed.

- If it needs the registers to be written into and read-back from the Flash ROM , click "Add" , it is showing

Data assignment

Starting address :

Data length :

Enter the starting address (For exa, R1000,D0...) and the data length (For exa, 199) , click "OK" , it is showing

Starting address	End address	Data length	
R1000	R1198	199	(For exa.)

It is allowed up to 6 groups of register for Flash ROM manipulation , click "Add" or "Edit" or "Delete" to accomplish the backup and retrieve of the registers.

Complete the editing of register groups , click "Finish" , it is showing  
Under programming , please wait...

It will show "Flash write OK" if this writing is successful.

It will show "Flash write error" if this writing is failed.

- Select "Erase Flash content" , click "Next" , it is showing

Please select the Flash model number

Manufacture	Part number	Index
Atmel	AT29C010	0
Atmel	AT49F010	1
Winbond	W29C011A	0
Winbond	W29EE011	0

Select the type of Flash ROM , then click "Finish" , it is showing

Under programming , please wait...

It will show "Flash erase OK" if this erase is successful.

It will show "Flash erase error" if this erase is failed.

- Select "Disable FLASH loading when power on" , click "Finish" , it is showing

Set OK!

Click "OK" to complete this setting.

\* If the user needs to put a new Flash ROM into the user's program socket , selecting this item first to avoid the undesired overwrite of ladder program by which storing in the new Flash ROM when power up.

This function is used to let PLC enter into the "Modify and Testing" mode mentioned previously .

- Select "Load FLASH content when power up" , click "Finish" , it is showing

Set OK!

Click "OK" to complete this setting.

\* Every power on , the ladder program and been assigned data registers storing in battery backup RAM will be replaced by which storing in the Flash ROM (if this Flash ROM had ever been written the ladder program into and been placed at the user's program socket) , and the PLC will be in "RUN" mode automatically regardless it's "RUN" or "STOP" mode before .

This is for mass production of machine manufacturing or long term easy maintenance via Flash ROM solution.