Chapte10. Library

By saving Function or Function Blocks as the files that can be used in a program, you can use them for your convenience. Sometimes you can create a new library file(defined by user).

10.1. Type of Library File

Library File consists of Function or Function Block.

Library File	Extension	Example
Function Library	.＊FU	stdlib.3fu:standard function library for GM3
Function Block Library	.＊FB	special.3fb:standard function block library for GM3

Note

In .***FU or .*FB** indicates the type of appropriate PLC in
(In case of GM3, the type is.3FU)

Library is divided according to a use of file as below.

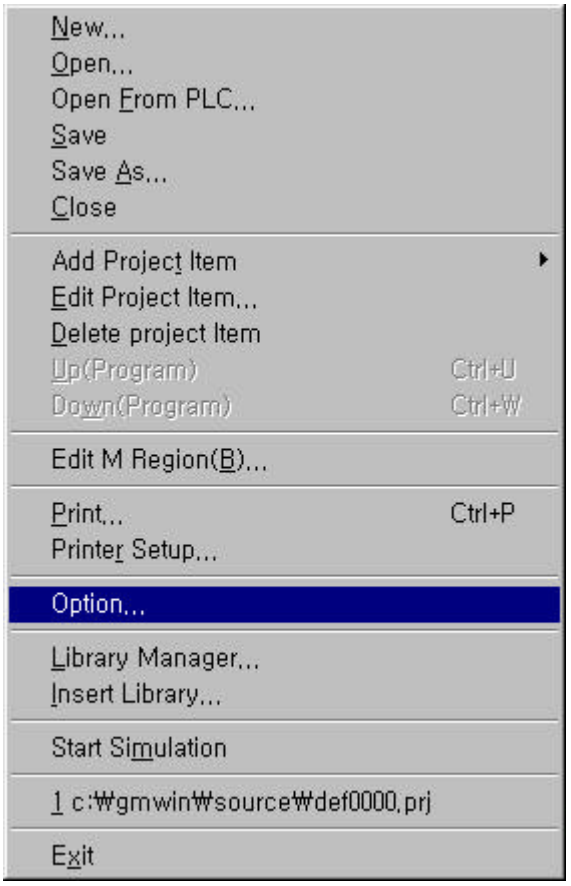
Library Type	Comment	Example
Standard Library	It is the files that collect basic functions/function blocks. (You can call it on the active program)	stdlib.*fu, stdlib.*fb
Exclusive Library	It is the files that collect the function blocks used in special/communication module(for A/D, D/A, Link..),etc.(To add this libraries, select **'Project-Insert Library'** menu)	special.*fb, communi.*fb
Extensible Library	It is the files that supplied by manufacturer for the user using other LGPLC.(To add this libraries, select **'Project-Insert Library'** menu)	mkstdlib.*fu (for MASTER-K)
User defined Library	It is a library that user make personally.(It is added by **'Project-Insert Library'** menu)	(User defined name)

10.2. Load a Library

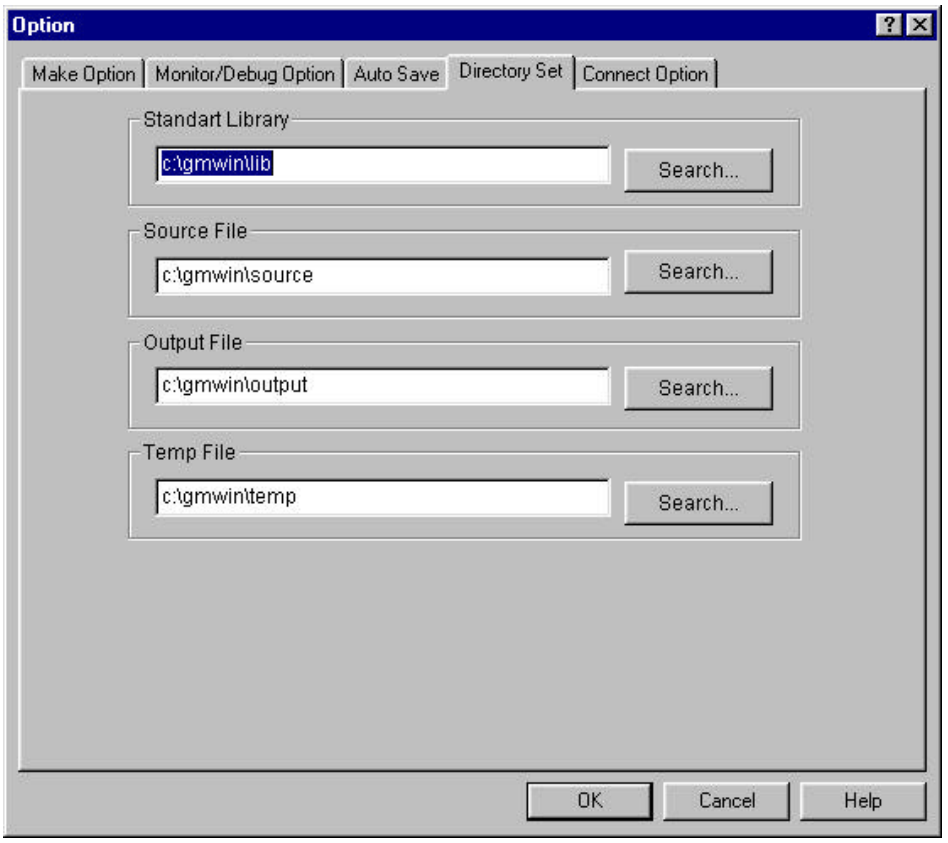
1) Load of Standard Library

On the dialog box is appeared when you select **Project-Option Directory** in the menu, if you execute GMWIN program in the designated directory, standard library is loaded automatically.

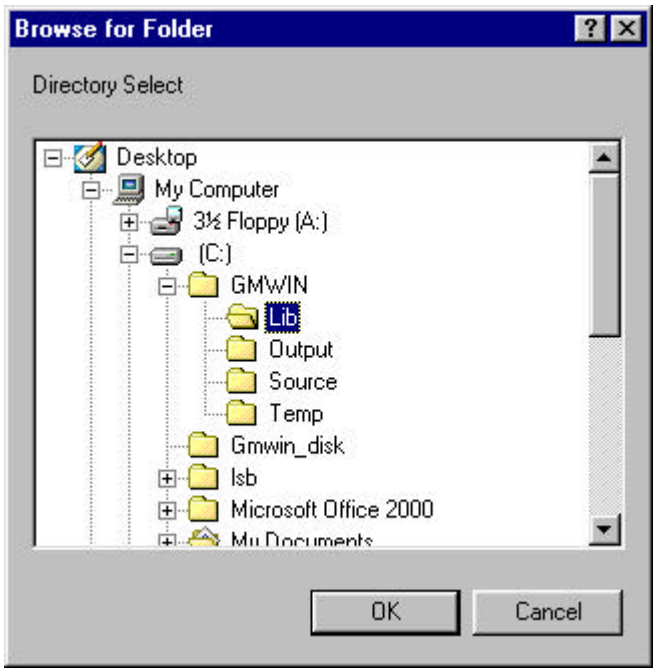
◆ Select option item in Project menu.



◆ Select folders in **Option** dialog box.



◆ Enter the path of library **in Standard Library** input text box of **Directory Set** menu. If you can't remember the path, select **Search** button where the library is in.



◆ In case that the library is not in the selected director, the error message appear as below

Note

If there are no "**stdlib.*fu**" and "**stdlib.*fb**" (*is the type of PLC. The type is stdlib.1fu for GM1) in the selected folder, an error message that cannot open appears when open a project. In this case, enter the folder correctly in **Project-Option-Directory Set** menu. Or copy the standard library to the selected folder.

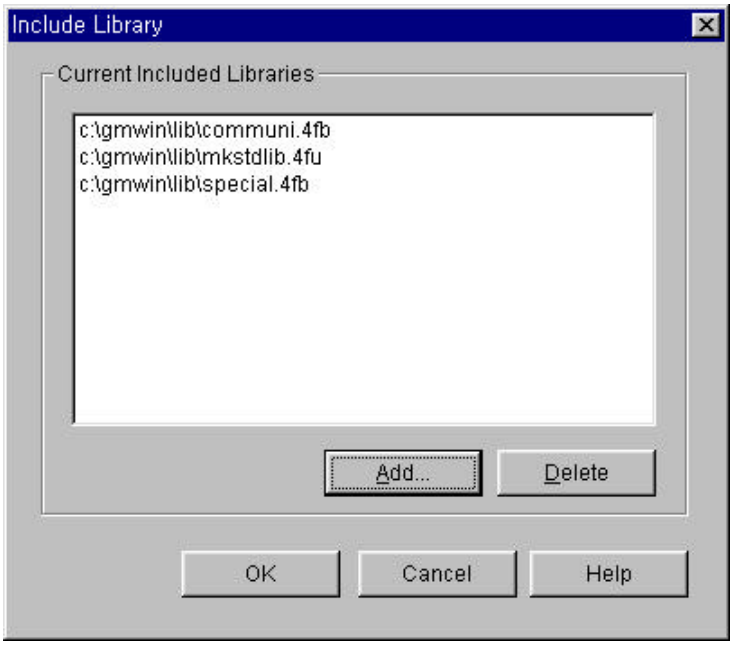
2) Load a Exclusive, Extensible Library and the User defined Library

You can load selectively exclusive, extensible library and user defined library.
In the state that project file is opened, call Include Library dialog box by selecting **Project-insert Library.**

Note

You can also call **Include Library** dialog box by double clicking after moving the mouse to a appropriate library item in library file list.

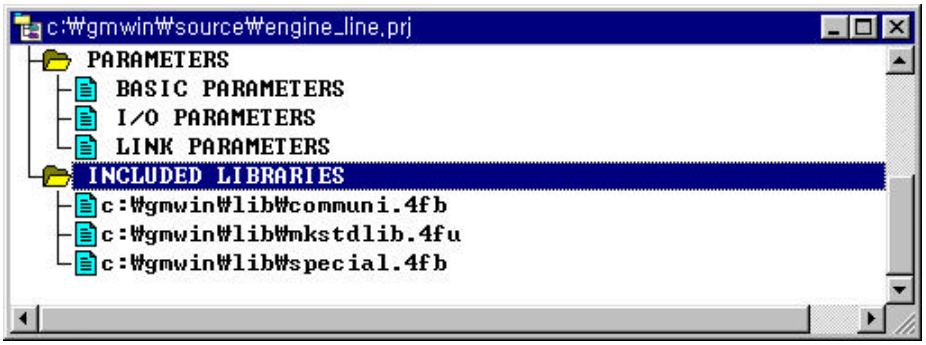
◆ Add a desired library in **Include Library** dialog box, and click **OK** button.



Libraries supplied by manufacturer and User define libraries are appeared in the library list as the above dialog box. If you select a desired library and click **Add** button, then added libraries appear Current Included Libraries.

(1) communi.3fb : Function blocks for the communication in GM3 (Cnet, Fnet, Mnet)
(2) mkstdlib.3fu : functions for MASTER-K series
(3) remote3.3fb:Function blocks for special modules in GM3(for REMOTE communication)

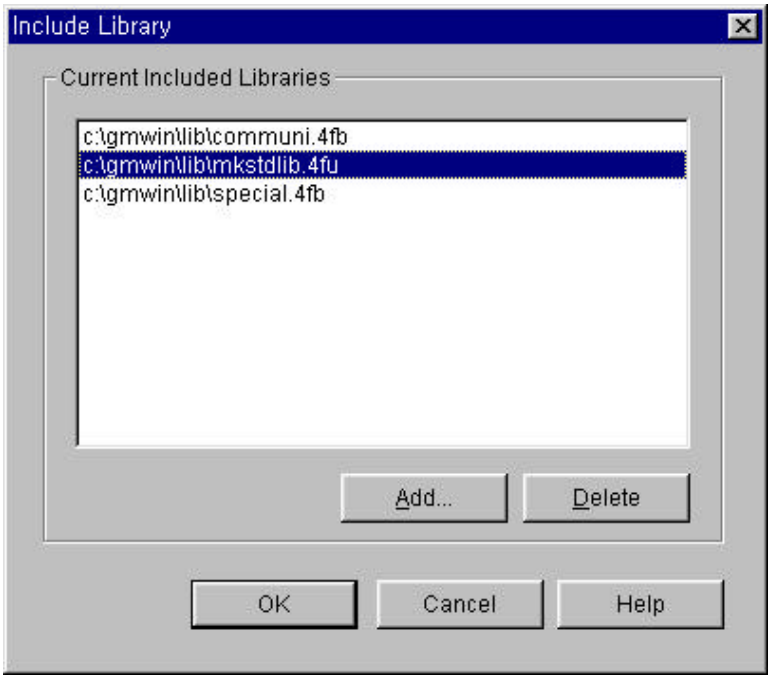
◆ If you finish to add the libraries, added libraries appear on Project window.



◆ When you add a library, If the item that selected in **Library List** is a standard library, the following error message appears.

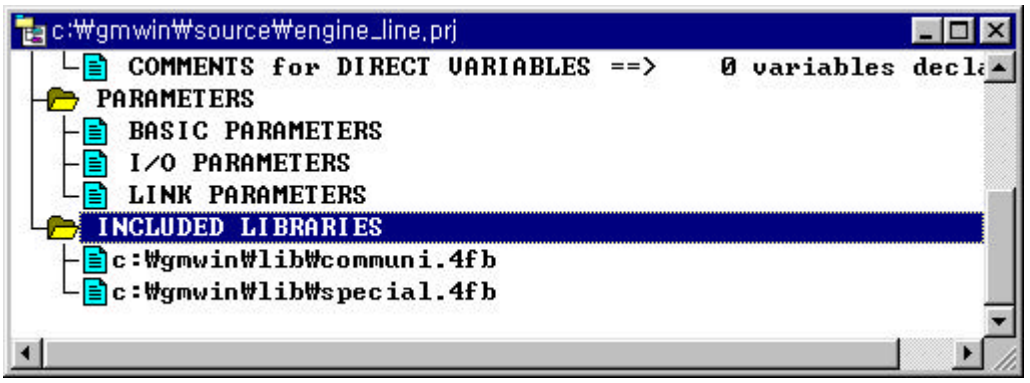
To delete the inserted library,

◆ In **Current Included Libraries** list box, select a desired library and click **Delete** button.



◆ Click **OK** button.

◆ You can confirm whether the library is deleted on project screen or not.



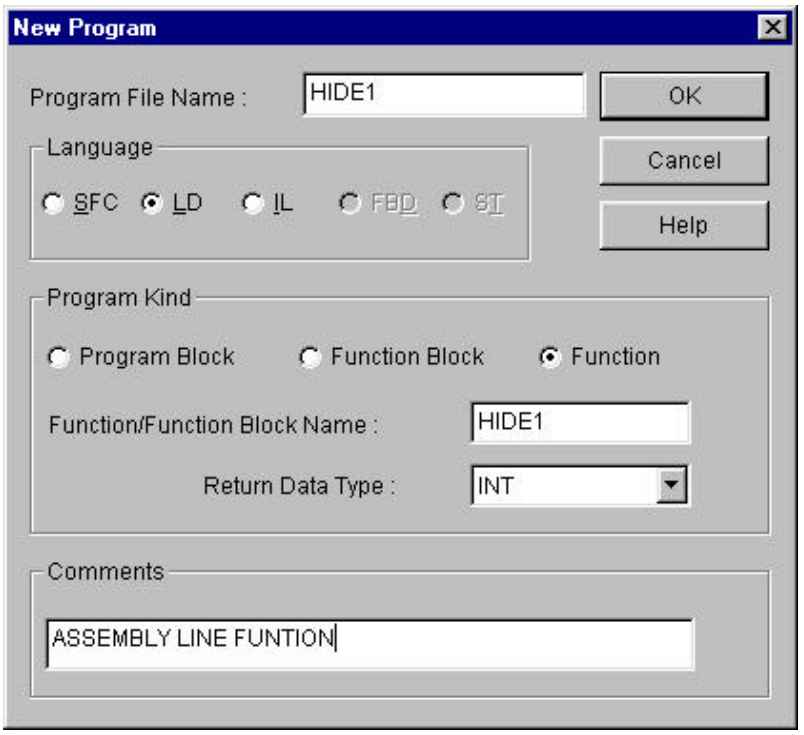
10.3. Create User Defined Library File

Besides standard library or extensible library, you can create and use a program, which is for you convenience, like as Function/Function block.

10.3.1. Create User Defined Function

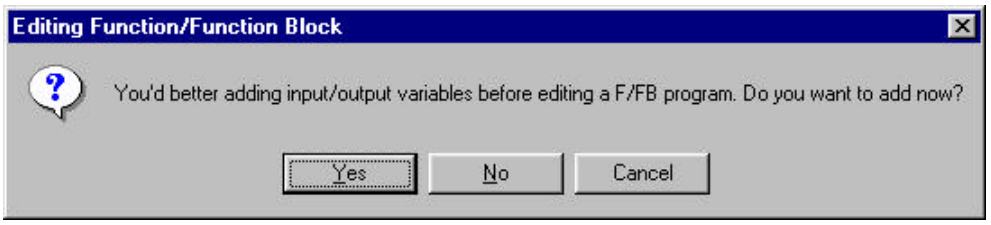
1) Create a new Function Program

◆ Select **Program –New program** in the pull-down  menu.

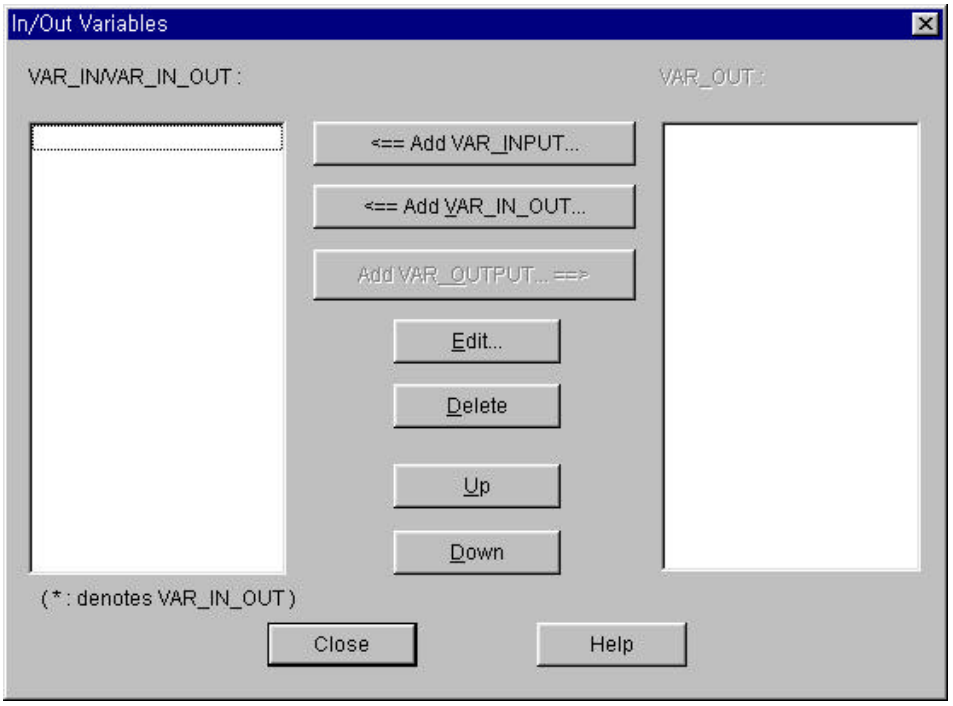


◆ Enter the name of function program to create with **"*.src"** in Program File name box.
◆ In Language option radio button, select language type to use in editing the function.
◆ Select **Function** in **Program kind** option button.
◆ In **Function/Function Block Name** input text box, enter the function name to use in another program
◆ In Return Data Type list box, select the type of variable.
◆ If there is an additional comment for the function, enter the comments in Comments window.
◆ Click **OK** button and the following message appear

◆ If you click **Yes** button, **In/Out Variables List** dialog box appears.

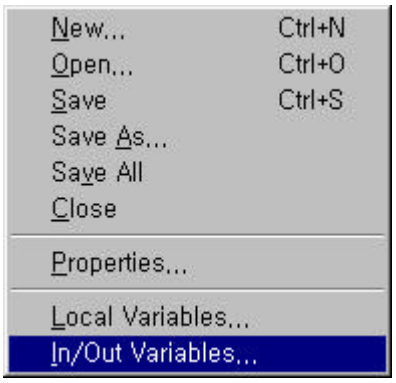


◆ If you click **No** button **In/Out Variables** window for the selected language appears.

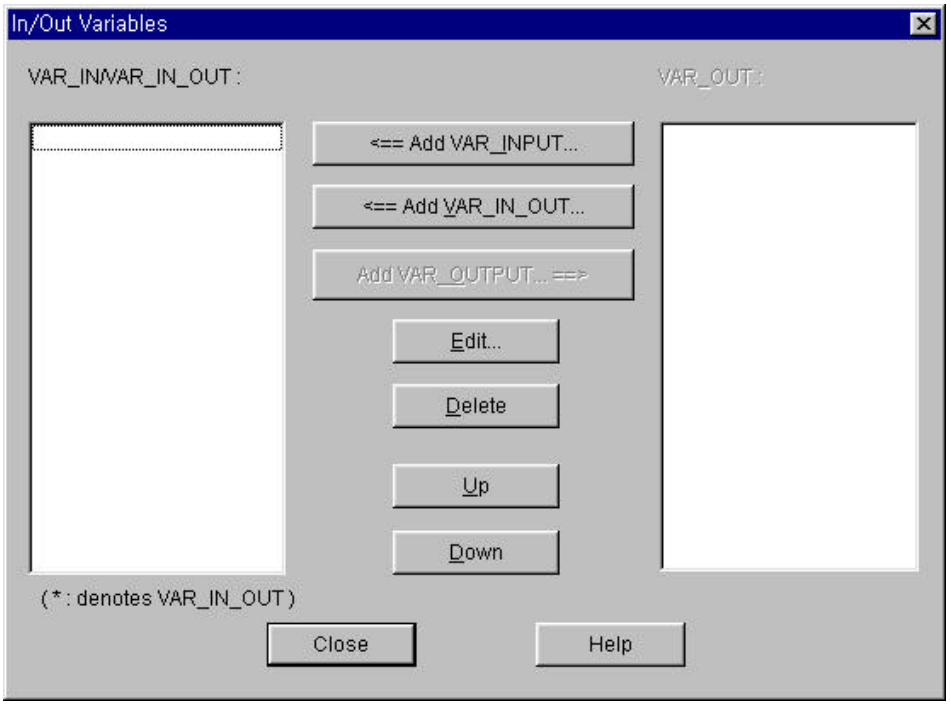


2) Create Input Variable

◆ Differently from editing a Program Block, **select Program-In/Out Variables** to create variables.



◆ Add a variable in I/O variable input text box of **In/Out Variables** dialog box.

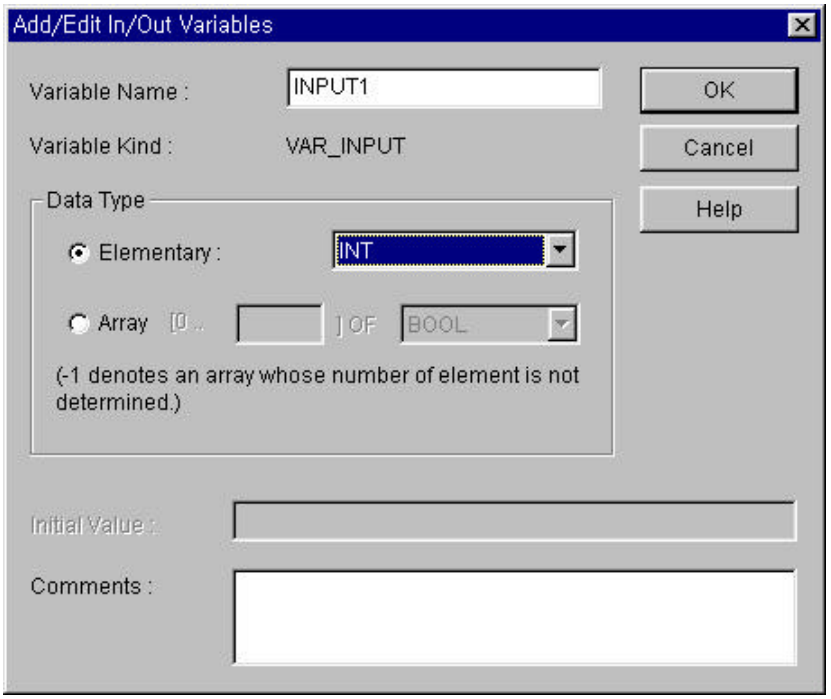


Note

VAR_IN_OUT is distinguished from VAR_IN by * mark. Differently from VAR_IN, VAR _ IN_OUT means that you can change the value of parameter taken from the side that call function / function block in that function / function block.

(1) Add an Input / Output Variable

- **Click Add VAR_INPUT, Add VAR_OUTPUT, or Add VAR_IN_OUT** button.



- Add a desired input/output variable name in **Variable Name** input text box. (Maximum size of name is 8 characters)
- Select a variable type in **Data Type** list box.
- If you need a comment about input/output variable, enter the comment in **Comment** window and click **OK** button.

Note

If you fix an array number as-1, it means that the array number of input variable is fixed when call the function/function block.

(2) Edit an Input/Output Variable

- Select the item that you want to edit in **In/Out Variables** list.
- Click **Edit** button.
- Edit the content that you want to correct in dialog box and click **OK** button.

(3) Delete an Input/Output variable

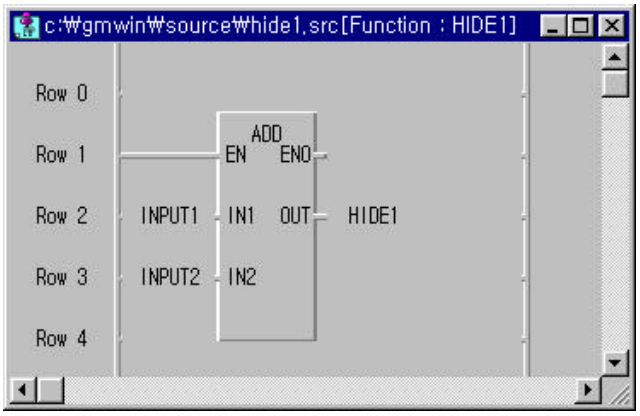
- Select the item that you want to delete in **In/out Variables** list.
- Click **Delete** button.

(4) Change the order of Input/Output variable

- Select the item that you want to change the order in **In/Out variables** list.
- Move the position of list by clicking **Upward** or **Downward** button as many as you want to move.

3) Create a Function Program

- You can create a program with the same way of other program.
- But, to return the result of function's calculation, an appropriate command to a name of function that was designated when created program is existed in Program.
  i.e., If a name of function is ADD_MUL in the outputted dialog box when select Program-Program Properties in the menu, the following command must be in the function program is creating.



4) Compile a Function Program

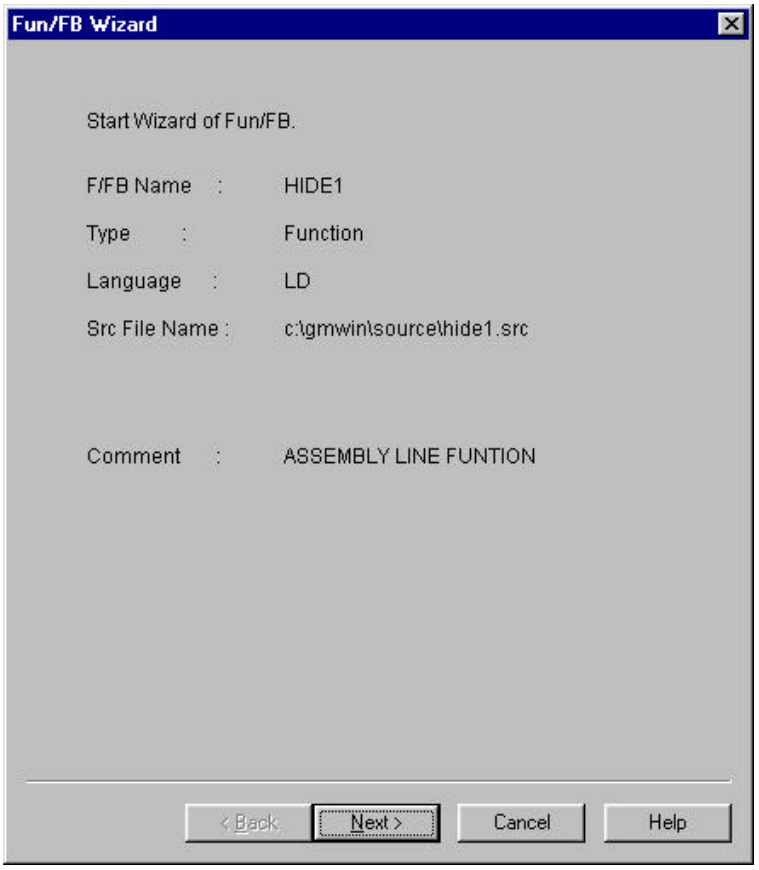
- If you finish creating a program, make an execution file by selecting **Compile-Compile** in menu.

Note

The object file is created after compiling a program. It has the extension of OF?. The execution code is changed according to a compiling on the project screen of PLC. (If you create an object file on GM1, it is applicable to GM1 only)

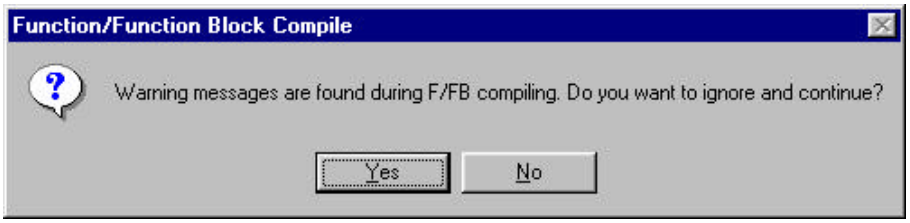
5) Function Wizard

◆ If a compiling is finished without an error and warning, **Wizard** dialog box appears automatically to insert the compiled function into the library.
Fun/FB Wizard dialog box shows the various information for function/function block.

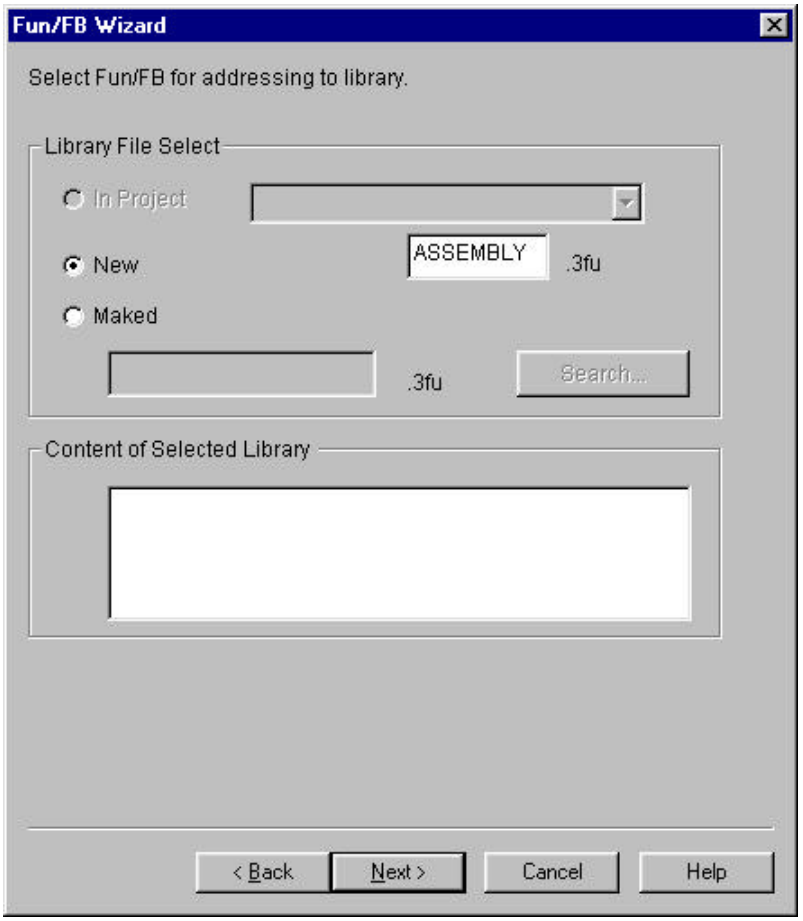


◆ If you select **Cancel** button, it stops inserting the compiled function into the library and project. If necessary, you can create a **User Defined Library** for the compiled function by selecting Project **Library Manager**. Similarly, you can also insert the compiled function into a project by selecting Project-Insert Library in menu

◆ If a compiling is finished with Warning messages, then the following message appears.



◆ Click the **Next** button in **Fun/FB Wizard** dialog box.

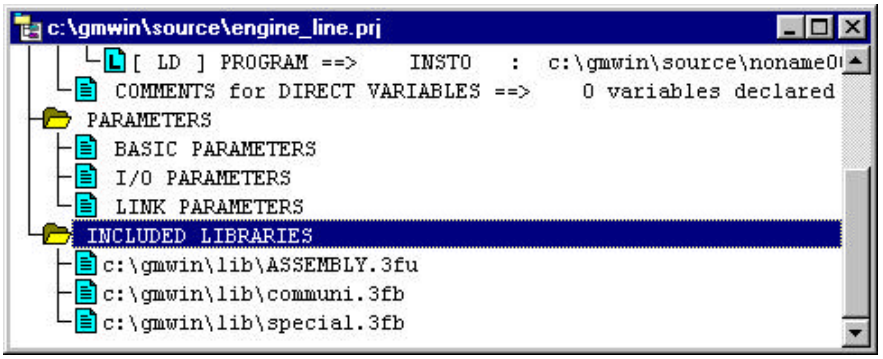


◆ In **Library File Select**, enter a new created library name in **New** input text box.
◆ If you want to insert a new created library form the user defined library that exists already in the project, click **In Project** button and select a desired library file.
◆ If you want to insert the library from the user defined library that does not exist in the project, select a desired user define library file after clicking **Marked** and **Search**.
◆ To call the 3rd dialog box, click the **Next** button.

◆ In this **Fun/FB Wizard** dialog box, it determines whether you insert the library into a current project. If the library selected in the previous dialog box exists in the project, the project updates the file automatically.

◆ Click **OK** button and **Next** button. Then the following dialog box appears.

◆ Click **Finish** button, then the new library is added on the project window.



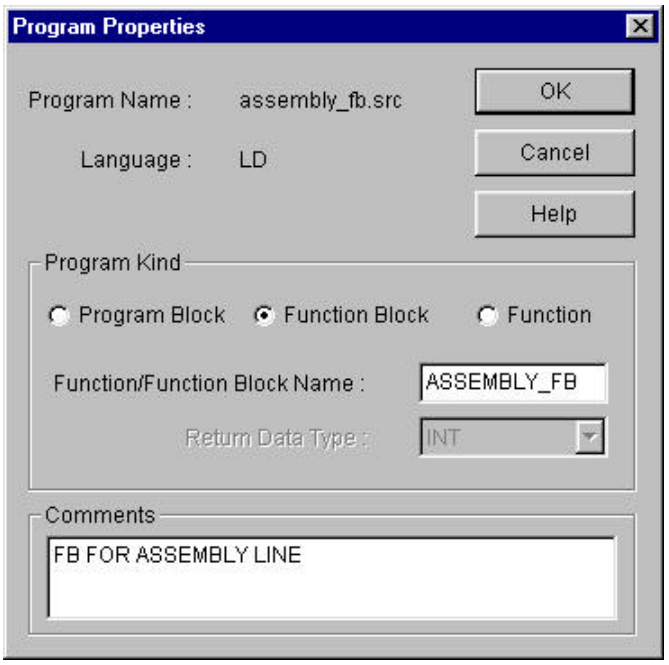
Note

If you click the **Cancel** button on each step of Library Wizard, cancelled all the processing at this time. To add a selected content on the project, please click **OK** button in the 4th dialog box.

10.3.2. Create a User Defined Function Block

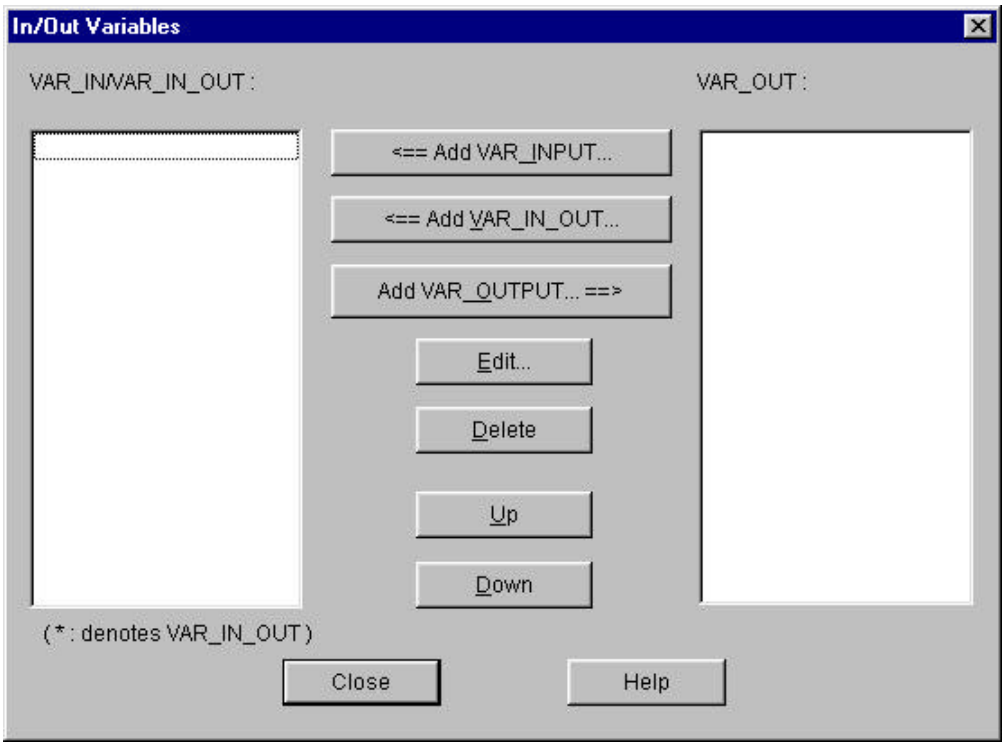
1) Create a Function Block Program

- Select **Program-New Program** in menu. Then a new dialog box appears



- Enter the Name of Function Block Program with ***.src** to create in the column of Program Name.
- When you create Function Block, select the type of language to use in **Language** option button..
- Select **Function Block** in **Program Kind** option button.
- In **Function/Function Block Name** input text box, enter the function block name to be used in another program.
- Do not designate the type of variable to be reurn.
- Click **OK** button and the following message appears.

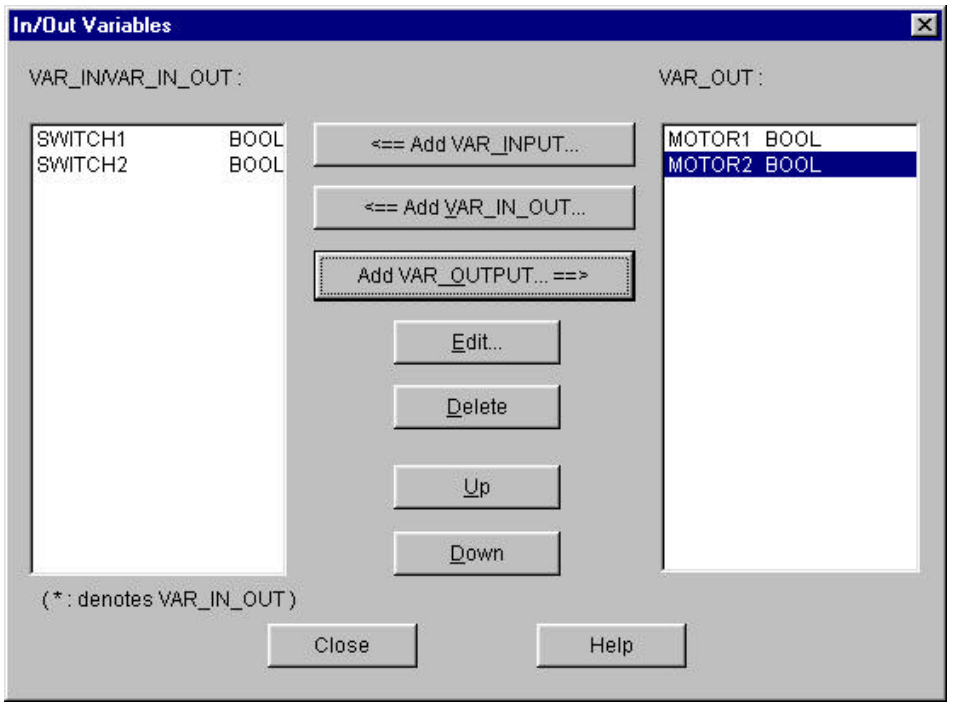
◆ If you click **Yes** button, In/Out Variables dialog box appears.



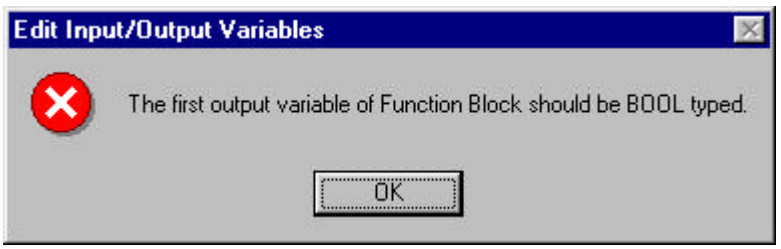
◆ If you click **No** button, edit dialog box for the selected language appears.

2) Create Input /Output Variable

◆ Creating method is same as the creating of function. However, in function block there must be more than one input-output variable instead of variable to return.

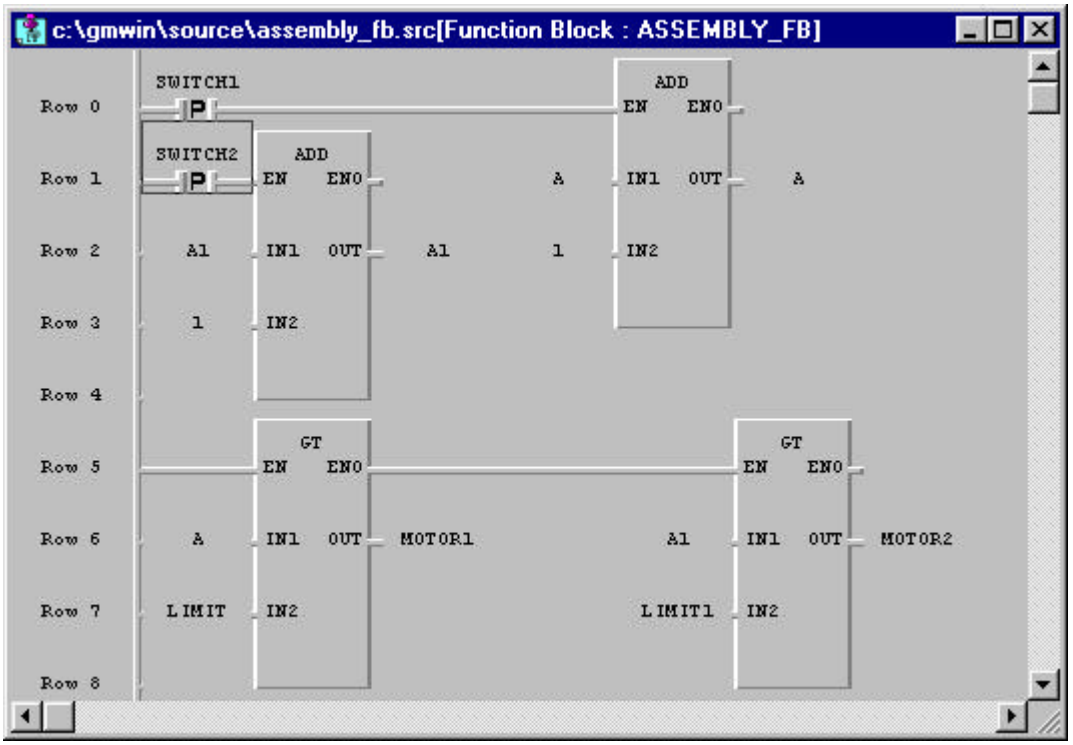


◆ To insert input/output variable, **use Add VAR_IN or _OUT…** button.
◆ When you insert input/output variable, the first input/output variable must be Boolean type. If it is not a Booean type, an error message appears.



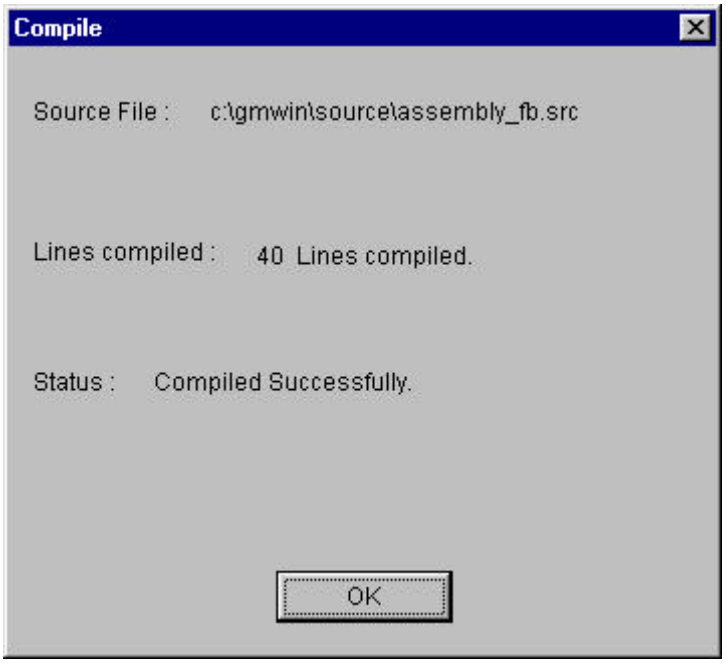
3) Create a Function Block Program

◆ You can create a program with the same way of other program.



4) Compile a Function Block Program

◆ If you finish creating a program, make an execution file by selecting **Compile- Compile(** ) in menu.

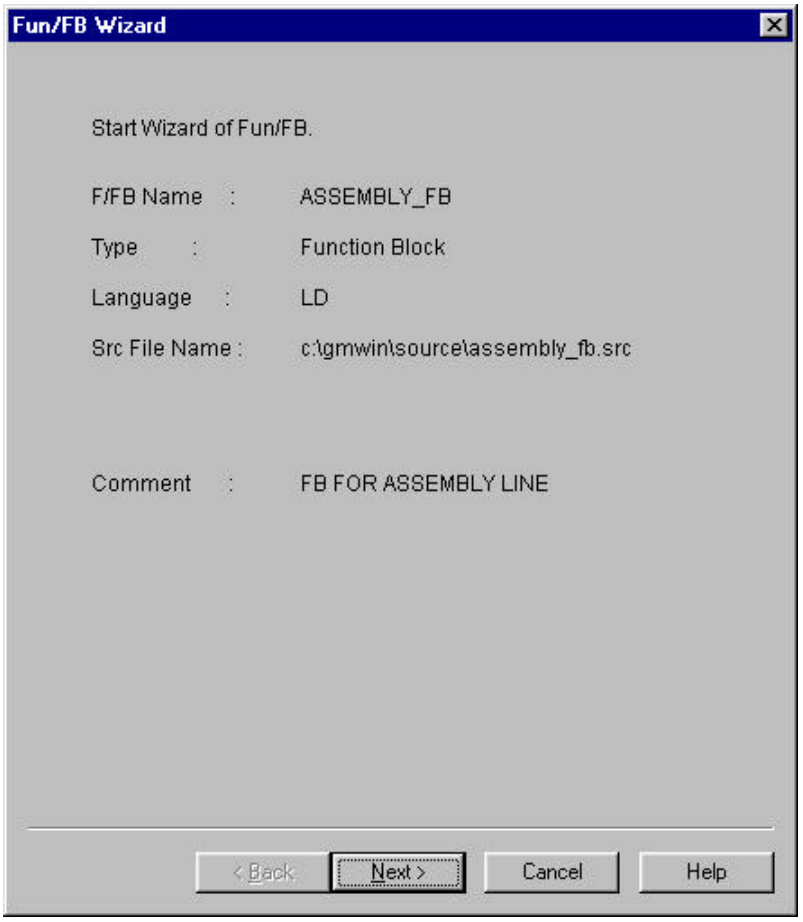


Note

The object file is created after compiling a program. It has the extension of ".*OB". The execution code is changed according to a compiling on the project screen of PLC. (If you create an object file on GM1, it is applicable to GM1 only)

5) Function Block Program Wizard

◆ If the compiling is finished without an error and warning, Fun/FB Wizard dialog box appears automatically to insert the compiled function block into the library.

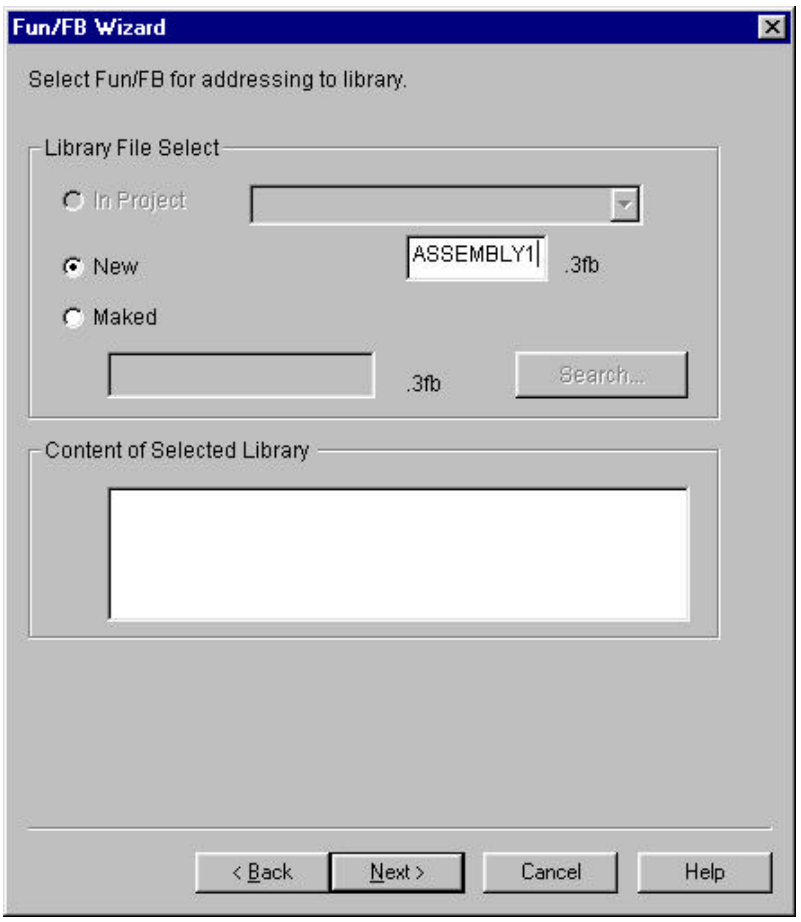


◆ If you select **Cancel** button in the above box, it stops inserting the compiled function block into a library and project. If necessary, you can make a **User Defined Library** for the compiled function block by selecting **Project-Library Manage.**

◆ If the compiling is finished with warning, the following message appears. This message asks whether you continue the function program wizard after correcting the warning.

◆ The first dialog box of function program wizard shows various information.

◆ Click **Next** button in the first dialog box of the function program wizard.

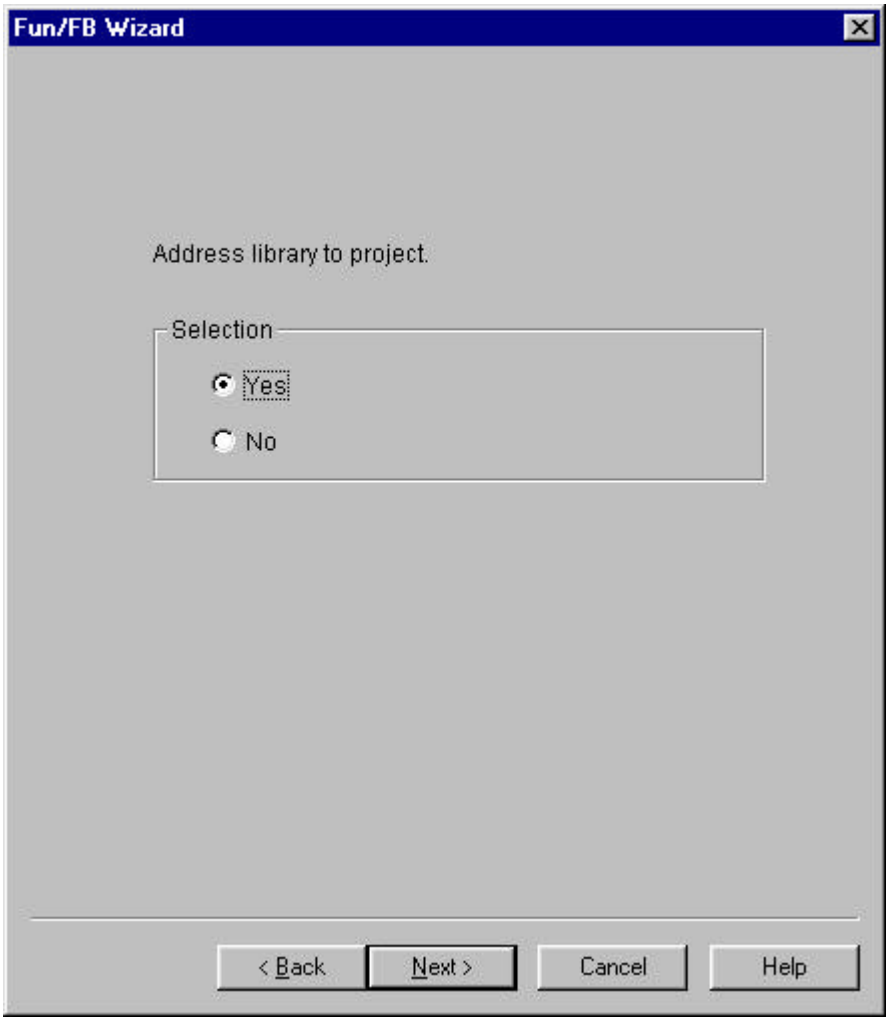


◆ In **Library File Select** of **Fun/FB Wizard** dialog box(the second dialog box), enter new created library name in **New** input text box.(GM3_FB1)

◆ If you want to insert new created library into user defined library that exists already in project, click **In Project** button and select a desired library file.

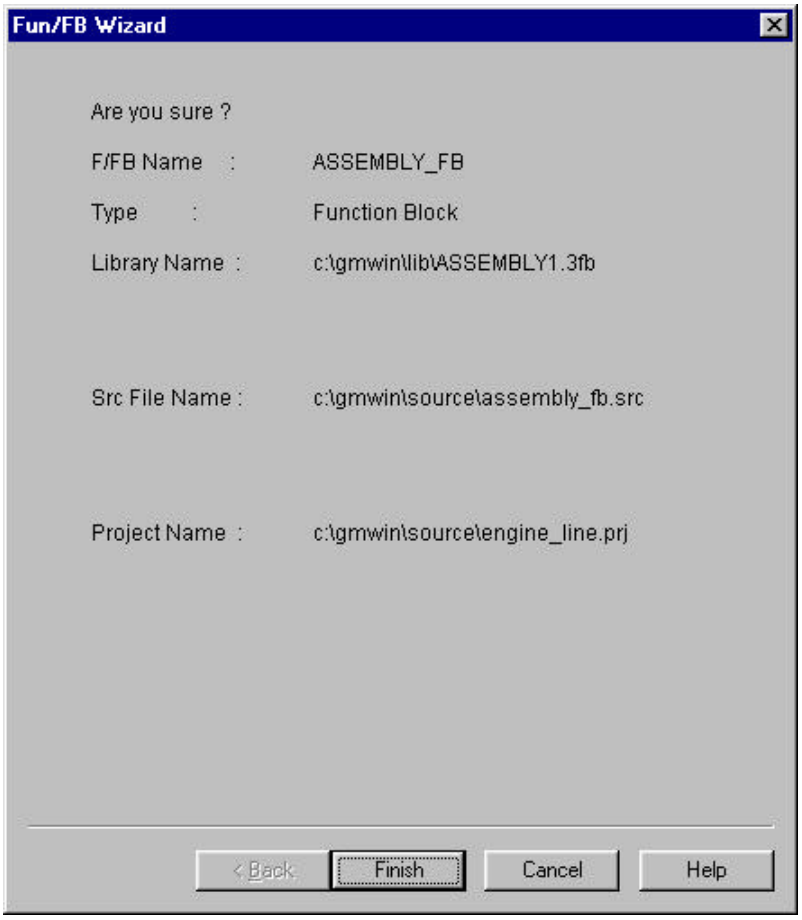
◆ If you want to insert the library into user defined library that does not exist in the project, select a desired library file by clicking **Made** button.

◆ If you finish selecting a file, click **Next** button.

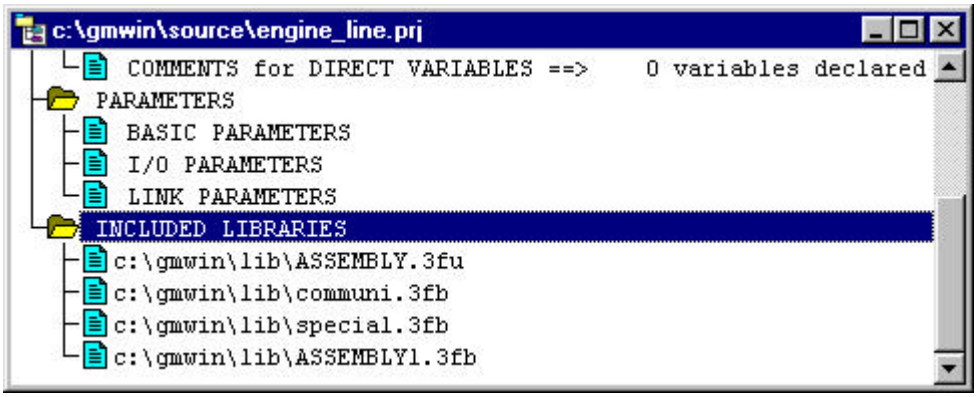


◆ In this Fun/FB Wizard dialog box, it is determined whether you insert the library, which has function block, into the current project. If the library selected in the previous dialog box exists in project is update automatically. In case of insert the function block into a new library file, it is optional to insert in project

◆ Select **Yes** button and press Next button. Then the **Fun/FB Wizard** dialog box appears.

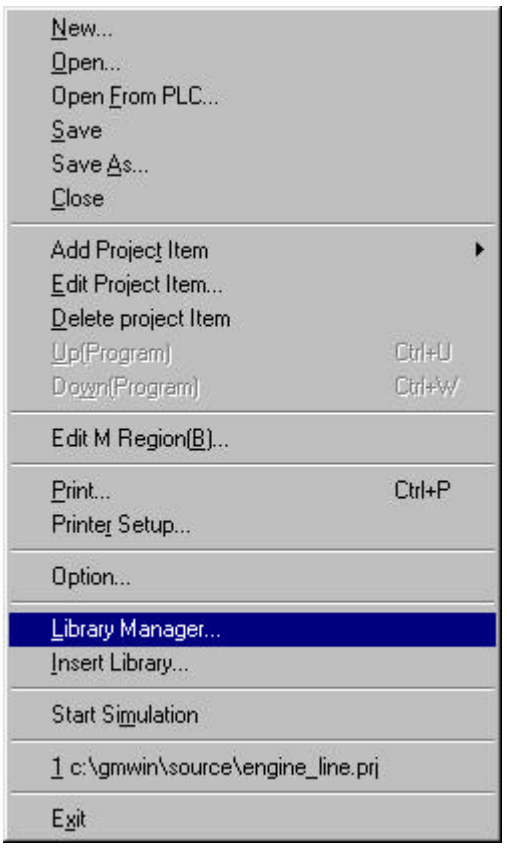


◆ Click **Finish** button, then a new **User FB** library appears on the project screen.



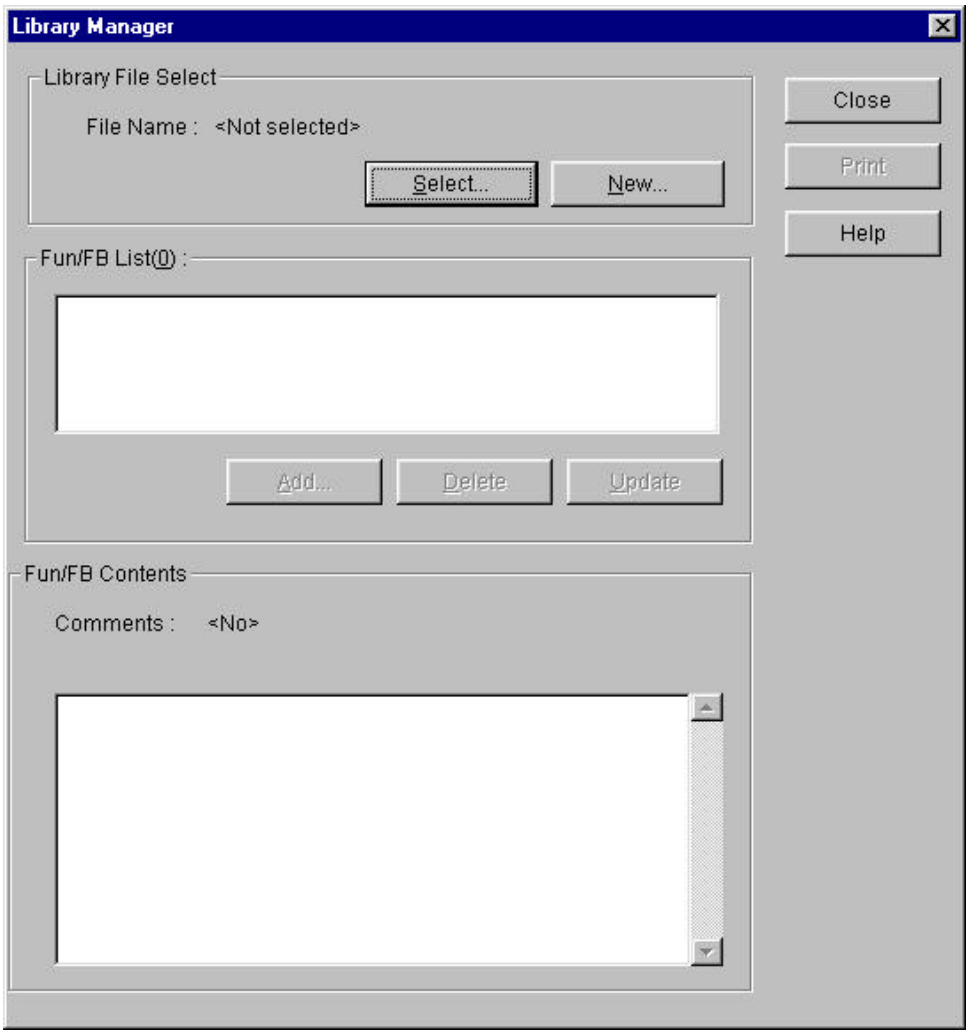
10.3.3. Library Manager

In Library Manager, you can create and edit library file that is not concerned with project.

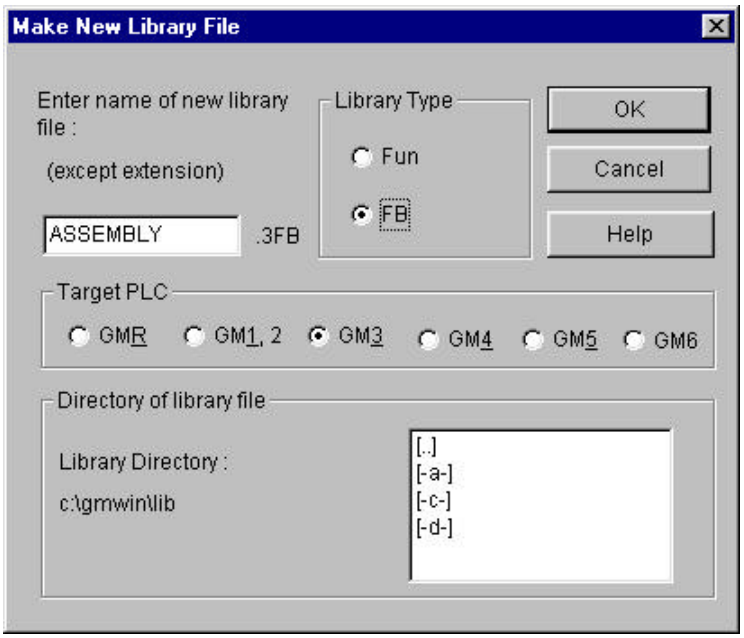


1) Create a Library File

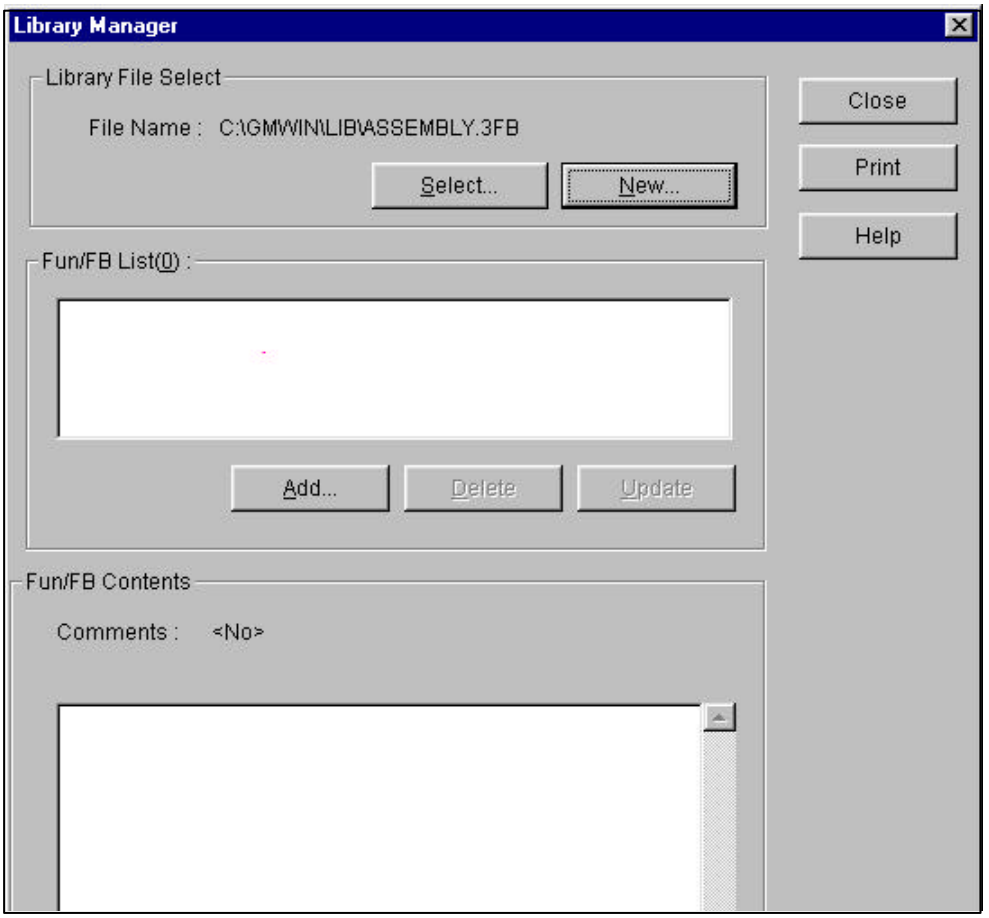
◆ To call the **Library Manager** dialog box, select **Project-Library Manager** in menu.



◆ To call the **Make New Library File** dialog box, click New in the **Library Manager** dialog box.

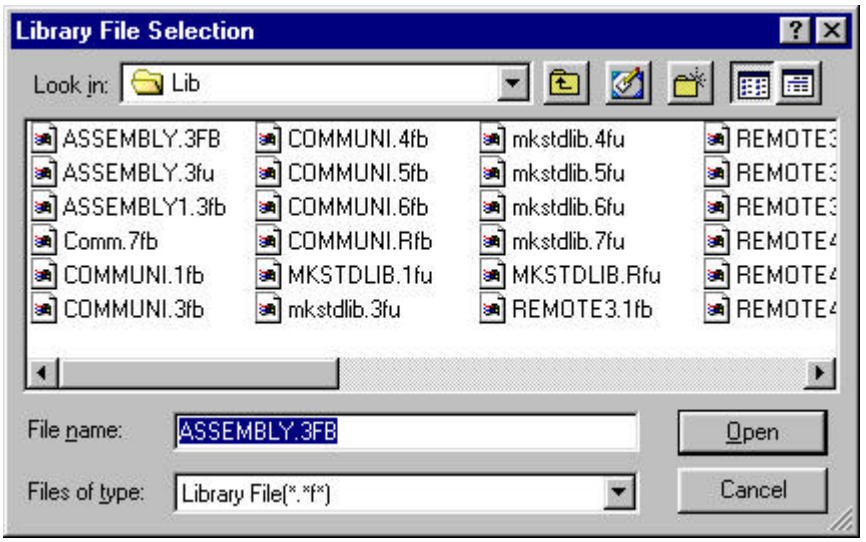


- Enter a library file name.(less than 8 characters)
- With library type option button, you can select the type of library to create newly.
- With objective PLC option button, select a PLC to which the library is applied.
- Select a directory in where the library file will be. At this time, it is important to input the same directory that fixed in **Directory of Library file** of option.
- Click **OK** button and library manager dialog box appears.

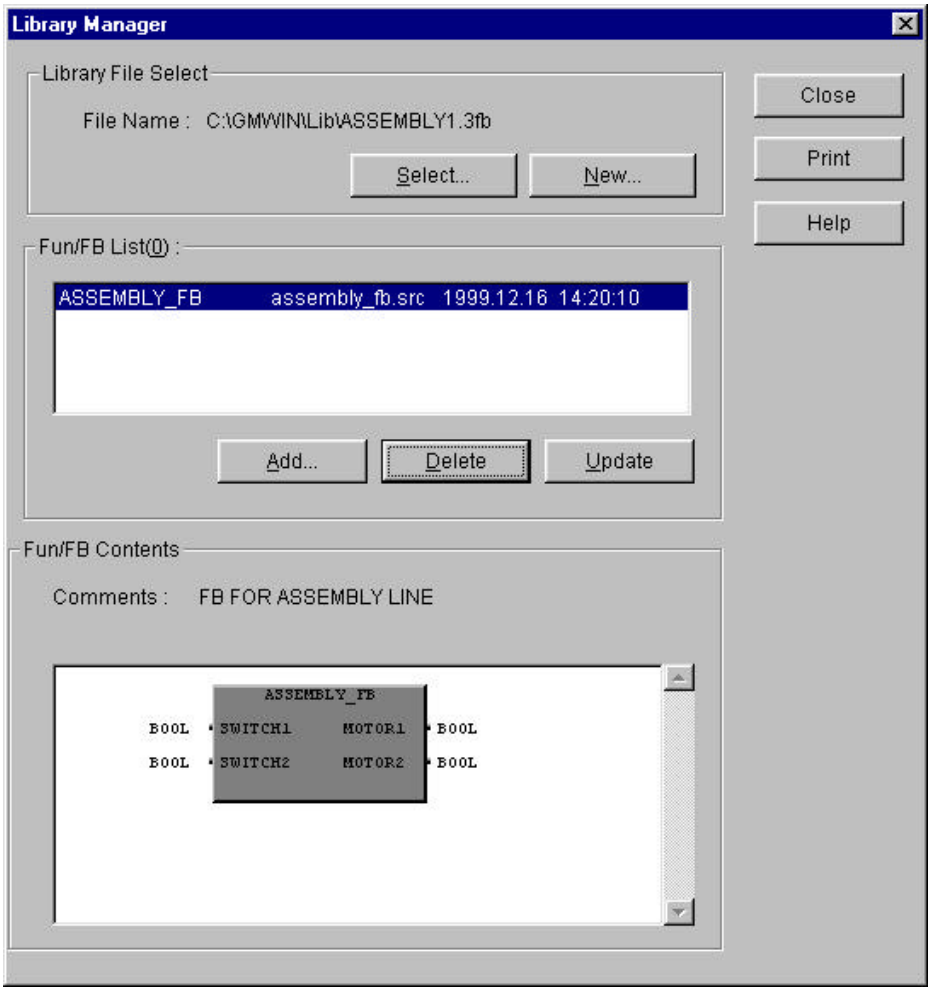


2) Select a Library File

- Click Select button in **Library Manager** dialog box.



- After selecting the library file that you want to edit, click **Open** button
- Then the entire function/function block in selected library file appears automatically in **Fun/FB List.**



- If you select a desired **Fun/FB** in the **Fun/FB** list, the content of selected **Fun/FB** is appeared on the **Fun/FB Contents**.

3) Add a Function/Function Block Object File

- **Enter Function/Function Block File** to add in **Add Function/Function Block** dialog box and click **OK** button.

4) Delete a Function/Function Block Object File

- In **Fun/FB List** in **Library** of **Library Manager** dialog box, select function/function block that you want to delete and click **Delete** button.

5) Update a Function/Function Block Object File

- In **Fun/FB List** in **Library** of **Library Manager** dialog box, select function/ function block that you want to update and click **Update** button.