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The FBD/LD/IL editor is a combined editor of the programming languages FBD, LD and IL.



If necessary, IL can be activated in the PLC Engineering options.

There is a common set of commands and elements and PLC Engineering automatically converts the three programming languages into one another internally.

The code in the implementation part is structured in all three languages by means of networks.

The menu *“FBD/LD/IL”* contains command when working in the editor.

Using the command, it can be switched between the three editor views at any time in offline and in online mode.

The behavior of the FBD/LD/IL editor is defined by the settings in *Tools → Options* (category *“FBD, LD and IL”*).



NOTICE!

There are some special elements that PLC Engineering cannot convert and thus it displays only in the applicable language. There are also constructs that are not clearly convertible between IL and FBD and are therefore 'normalized', i.e. nullified, when converted back to FBD. This applies to the: Negation and explicit/implicit assignments for function block inputs and function block outputs.

An error-free conversion between the languages requires syntactically correct code. Otherwise parts of the implementation can be lost.

Also refer to

- ↘ *“FBD/LD/IL”* (programming)
- ↘ *“FBD/LD/IL”* menu (Commands)
- ↘ *“Options”* - *“FBD, LD and IL”* dialog

FBD and LD editor

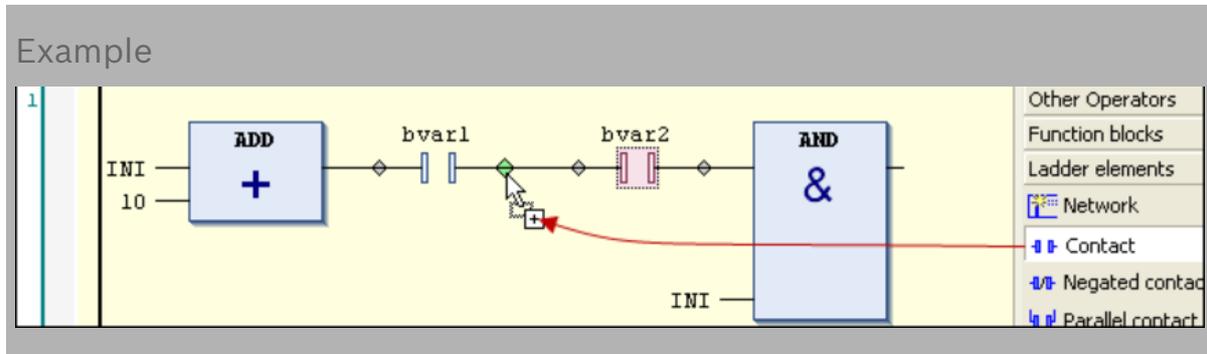
Inserting and arranging elements

You can drag elements with the mouse from the view *“Tools”* (toolbox) into the implementation part of the editor. Alternatively you can use the commands of the context menu or the *“FBD/LD/IL”* menu.

Settings for the display and interface are defined in the PLC Engineering options, category *“FBD/LD/IL”*.

If you drag an element with the mouse over a network in the editor, all possible insertion positions are displayed with

gray diamond-shaped, triangular or arrow-shaped position marks. As soon as the mouse pointer is located over one of these marks, the mark turns green. If the mouse button is now released, PLC Engineering inserts the element at this position.



If you drag a function block or an operator from the toolbox or a network at the left-hand side of the network onto one of the two arrows, then PLC Engineering automatically creates a new network and inserts the element there.

In order to replace an element, drag a suitable other element onto its position with the mouse. Elements that you can replace by the new element are marked by PLC Engineering in the editor with text fields, for example *“Replace”*, *“Attach input”*.

You can use the usual commands in the menu *“Edit”* for cutting, copying, pasting and deleting elements. Copying also works with drag&drop, keeping the [*Ctrl*] key pressed.



NOTICE!

The operators with EN/ENO functionality can only be inserted in the FBD and IL editors.

Selecting elements

A box or a connecting line in the editor is selected by clicking it with the mouse so that it has the focus. Multiple selection is possible while the [*Ctrl*] key is pressed. A selected element is highlighted in red.

Tooltip

If the cursor points to certain elements, for example to a variable or to an input, a tooltip appears showing information about this element.

In the case of elements underlined with a wavy red line, the tooltip shows the pre-compile error message of the error that occurs with this element.

Navigating in the editor

Navigating in the editor

With the help of the keys and commands described below, you can place the focus within the editor on a different cursor position. The change between the positions is also network-spanning in function.

[→]	Change to the neighboring cursor position, along the signal flow, i.e. from left to right, and the other way around.
[®]	
[] [^]	Change to the next cursor position above or below the current position, if this neighboring position belongs to the same logical group. For example, all connections of a box form a logical group.
[^]	
	If such a logical group does not exist: Change to the first cursor position in the next higher or lower neighboring element. In the case of parallel-connected elements, navigation takes place along the first branch.
[Ctrl] + [Home]	Change to the first network; this will be selected.
[Ctrl] + [End]	Change to the last network; this will be selected.
[Image]	Scrolls up 1 page; the topmost network on this page is selected.
[Image ^]	Scroll down 1 page; the lowest network on this page is selected.
Command [Go to...]	Change to a certain network.

Open function blocks:

If a function block is inserted in the editor, open its implementation by a double-click or with the context menu command *Browse for symbol → Go to definition*.

Also refer to

- \ “Function block diagram (FBD) ”
- \ “Ladder diagram (LD)”
- \ “Programming in a function block diagram (FBD)”
- \ “Programming Ladder Diagrams (LD)”
- \ “Elements (FUP/LD/IL)”
- \ ““Options” - “FBD, LD and IL” dialog”
- \ “FBD/LD/IL Editor in Online Mode”
- \ “Command 'Go to'”

IL editor

Inserting and arranging elements:

You can insert elements with the help of the commands of the menu *“FBD/LD/IL”* in the context menu. A new network

can also be dragged from the toolbox into the implementation section of the editor.

You can use the usual commands in the menu *“Edit”* for cutting, copying, pasting and deleting elements. Copying also works with drag&drop, keeping the *[Ctrl]* key pressed.



NOTICE!

Please note that operators with EN/ENO functionality can only be inserted into the FBD and IL editors.

Each program line is entered in a table row.

Structure of networks in the IL editor

1st line: Network title

Prerequisite: The option is activated in the PLC Engineering options.

2nd line: Network comment

Prerequisite: The option is activated in the PLC Engineering options.

From the third line:

Column	Content	Description
1	Operator	Contains the IL operator (LD, ST, CAL, AND, OR, etc.) or a function name. When calling a function block, additionally specify the corresponding parameters here; in the preceding field, enter := or =>.
2	Operand	Contains precisely one operand or the name of a jump label. In the case of several operands you must enter them in several rows and when doing so insert a comma directly behind the individual operands. (See example below)
3	Address	Contains the address of the operand as defined in its declaration. Not editable You can activate/deactivate the display via the option <i>“Display symbol address”</i> . To do this, click <i>Tools → Options</i> and the <i>“General”</i> tab in the <i>“FBD, LD and IL”</i> category.

- | | | |
|---|-----------------|---|
| 4 | Symbol comment | <p>Contains the comment that was specified for the operand if necessary in the declaration.</p> <p>Not editable</p> <p>You can activate/deactivate the display by means of the <i>“Display symbol comment”</i> option if you click <i>Tools → Options</i> and the <i>“General”</i> tab in the <i>“FBD, LD and IL”</i> category.</p> |
| 5 | Operand comment | <p>Comment for the current program line.</p> <p>You can activate/deactivate the display by means of the <i>“Operand comment”</i> option if you click <i>Tools → Options</i> and the <i>“General”</i> tab in the <i>“FBD, LD and IL”</i> category.</p> |

Example

Spalte:

1	2	3	4	5
CALL	tonInst1(IN:= bVar, PT:= t1, ET=> tOut1)			
LD	tonInst1.Q		<i>is TRUE, PT seconds after IN had a r...</i>	
ST	tonInst2.IN		<i>starts timer with rising edge, reset...</i>	
CALL	tonInst2(PT:= t2, Q=> bReady, ET=> tOut2)	<i>\$QB1</i>		<i>for tonInst2</i>

Navigating in the editor

Key(s)/command	Cursor movement
<i>[↑]</i>	Jumps to the field located above/below.
<i>[↓]</i>	
<i>[Tab]</i>	Jumps one field to the right within the row.
<i>[Shift] + [Tab]</i>	Jumps to the left to the preceding field within the row

Key(s)/command	Cursor movement
<i>[Space]</i>	Opens the editing frame for the selected field. Alternatively, click on the field. If applicable, the button for the input assistant dialog is available.
<i>[Ctrl] + [Enter]</i>	Inserts a new row below the current row.
<i>[Del]</i>	Deletes the current row.
<i>[Ctrl] + [Home]</i>	Sets the focus at the start of the document and marks the first network.
<i>[Ctrl] + [End]</i>	Sets the focus at the end of the document and marks the last network.
<i>[Image down]</i>	Scrolls up a page and marks the top rectangle.
<i>[Image up]</i>	Scrolls down one page and highlights the top rectangle.

Also refer to

- \ “Instruction list (IL)”
- \ “Programming in Instruction List (IL)”
- \ “Modifiers and operators in IL”
- \ ““Options” - “FBD, LD and IL” dialog”
- \ “FBD/LD/IL Editor in Online Mode”