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TECHNOLOGIE TRANSFER
DIPL.-ING. B. P. SCHULZ-HEISE

Getting Started with

S5 for Windows[®]

Version 6.x

Content

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Complete training classes available for *S5 for Windows*®, *S7 for Windows*®, and also for the Siemens PLC Programming Software Step® 7.

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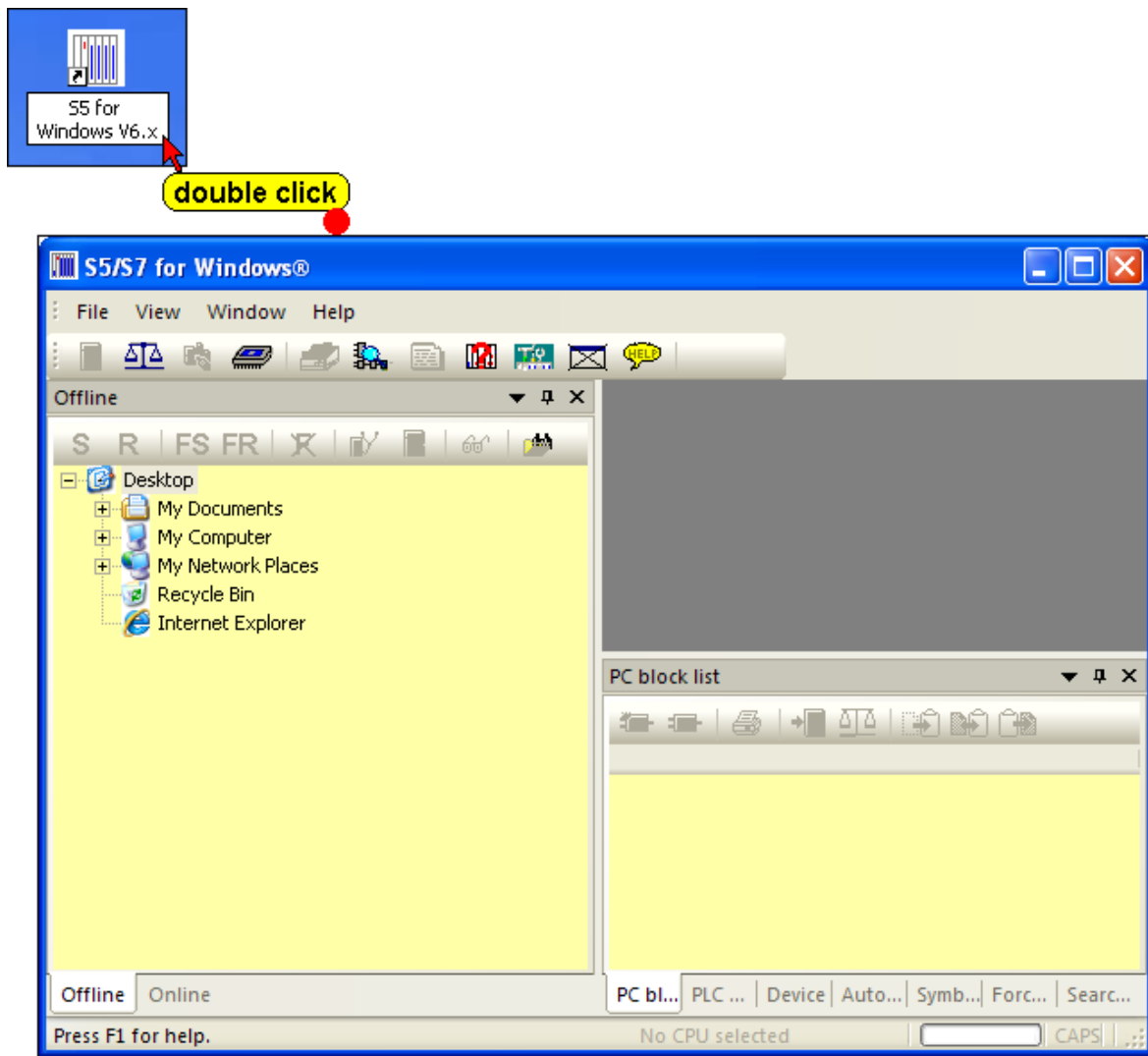
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1 S5 for Windows® Basics

To work with S5 for Windows® basic skills are necessary.

1.1 Opening the S5 for Windows® Software

During the installation of S5 for Windows® an icon has been inserted. Double click the icon “S5 for Windows®” to start the programming system.

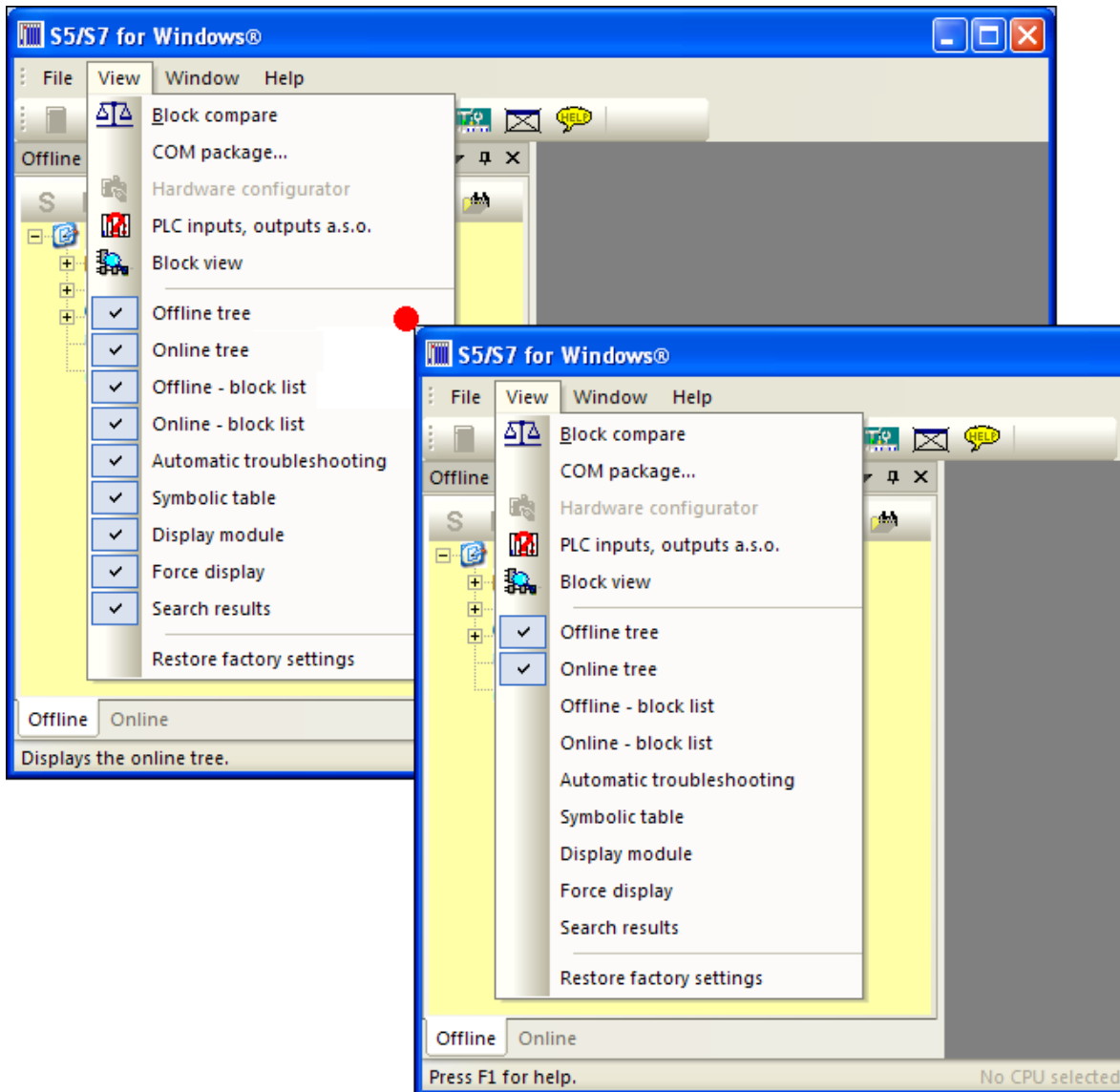


Several “tabs” are displayed outside the border on the left as well as the button for the S5 for Windows® window.

We recommend the following settings for easier use of *S5 for Windows®*.

1. Close all unnecessary windows.

Open the “**View**” menu and select the “Offline tree” and “Online tree”. Deselect all other views.



The “**Offline tree**” is used to select the “**S5 Project**” you want to **work with**. The S5 Project contains the files necessary for a S5 PLC program. Further on it will be explained how to generate a S5 Project. An S5 Project is always required to work with a S5 PLC program executed on a PLC.

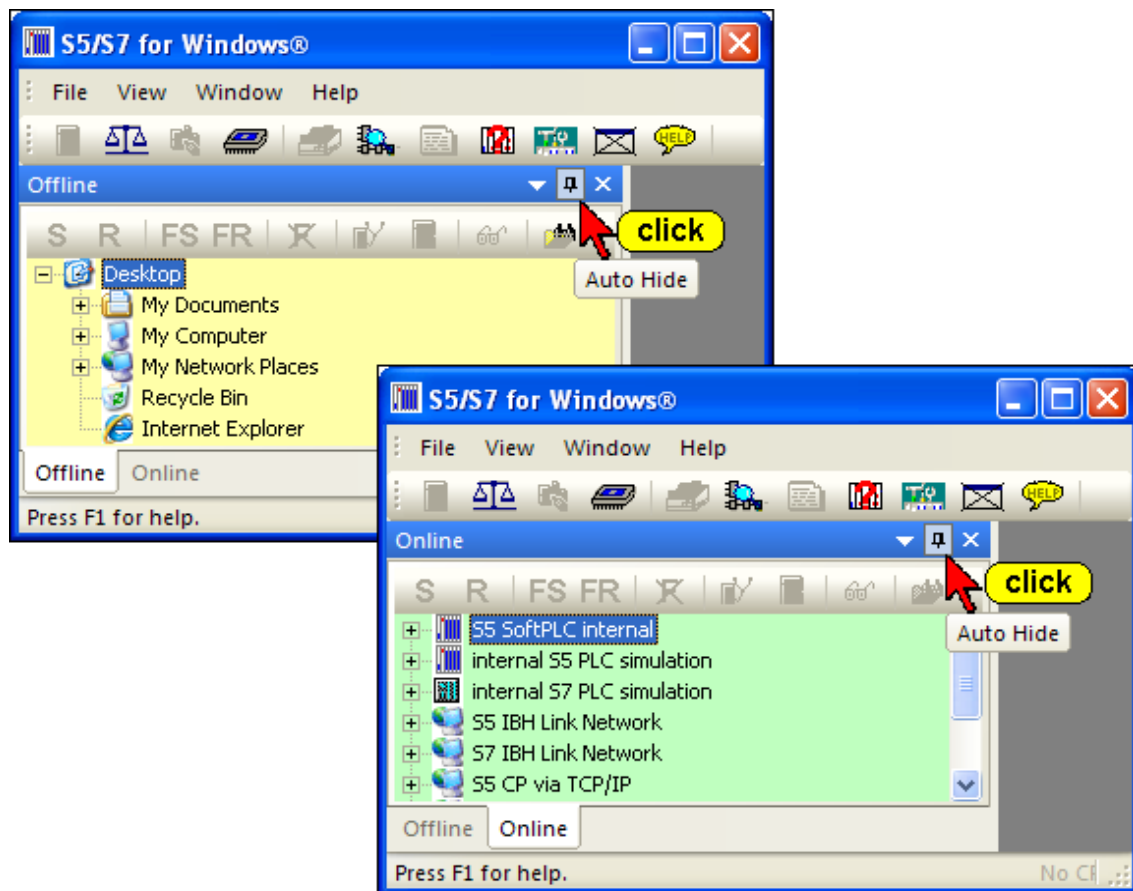
The “**Online tree**” is used to select the PLC to be connected with.

2. Using the “Auto Hide” functions.

It is recommended that you use the “Auto Hide” icon to lock the tab at the outside border of *S5 for Windows®*. By bringing the mouse pointer to the tab, the window will open automatically.



Use the “Auto Hide” icon to close the “Offline tree” and the “Online tree”.



3. Operator Interface mode.

Version 6.x of *S5 for Windows®* has a new concept for opening and closing windows in the workplace.

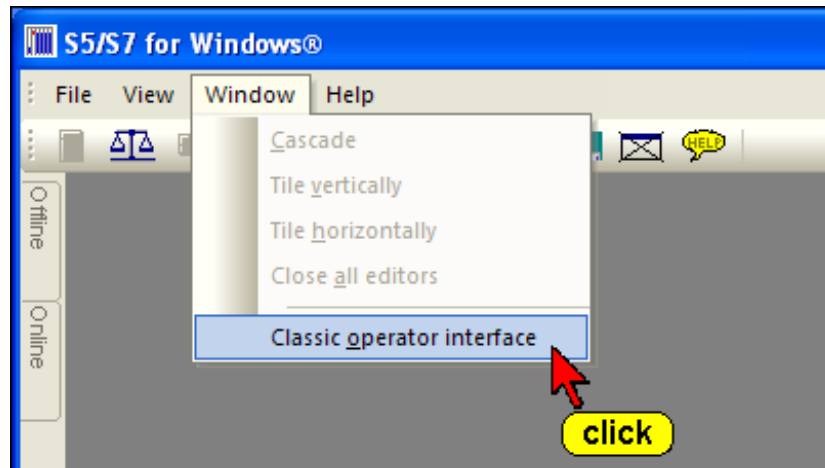
You can use the “Auto Hide” icon to lock the tab at the outside border of the workplace. By moving the mouse pointer to the tab, the window will open automatically. As soon as the mouse pointer leaves the automatically opened window, the window is closed.

If you click at tab the opened window will stay open until it is closed.

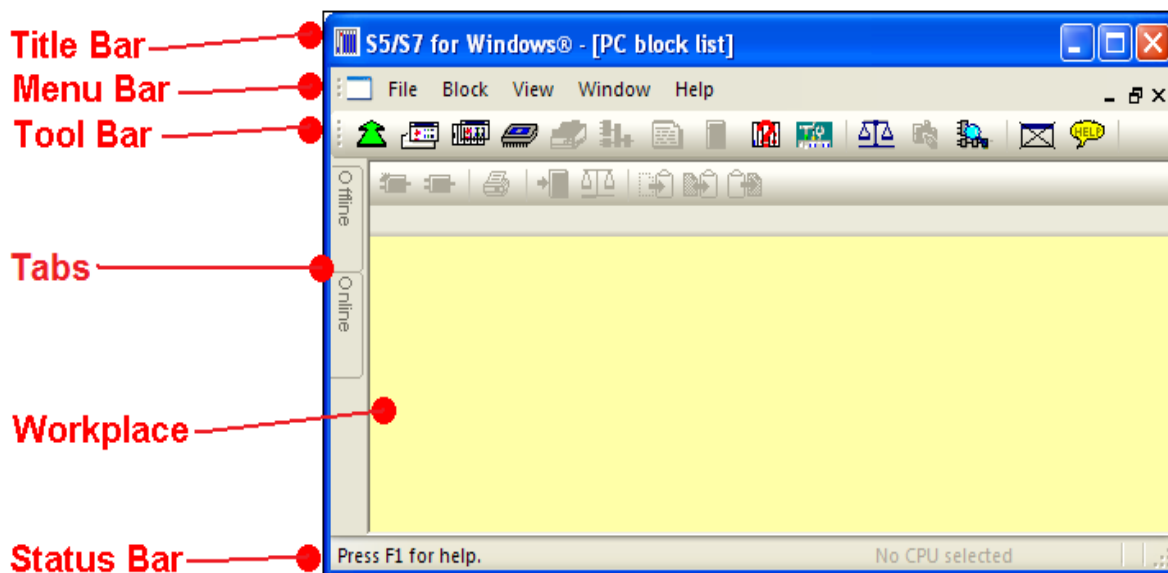
Classic Operator Interface

If the “Classic operator interface” mode is selected, the “Tool Bar” is extended and the open windows will stay open until they are closed.

To select the previously described mode, click “Classic operator interface” in the “Window” menu.



1.2 S5 for Windows® Basic Window (Classic Operator interface)

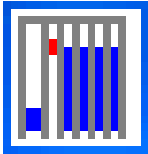


In “Classic operator interface” mode the “PC Block List” window is open and fills the whole workplace.

Title Bar



The title bar displays *S5 for Windows®*, and, if an additional Window is open in the workplace, the name of the open window is also displayed. The Icons are “Windows” specific.



Open Control menu

This icon opens the Control menu that contains the commands to Restore, Move, Size, Minimize, Maximize, or Close the open Window. The Keyboard shortcut is Alt + Spacebar.



Minimizing the open window to an icon

Clicking the button at the right side of the S5 for Windows title reduces the open window to the size of an icon (same function as the **Minimize** command from the Control menu).



Maximizing the open window

Clicking the Maximize button in the upper right corner of S5 for Windows will enlarge the window to its maximum size (same function as the **Maximize** command from the Control menu).



Restoring an enlarged window to its previous size

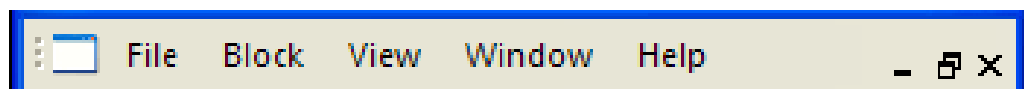
Clicking the Restore button in the upper right corner of S5 for Windows will restore an enlarged window to its previous size (same function as the **Restore** command from the Control menu).



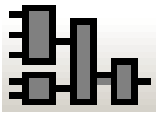
Closing S5 for Windows

Clicking the Close button in the upper right corner of S5 for Windows will terminate S5 for Windows (same function as the **Close** command from the Control menu).

Menu Bar



The menu bar lists the available menus. The menus contain the available commands of *S5 for Windows®*. The menus in the menu bar change depending on the *S5 for Windows®* application windows opened. You can open a menu by clicking the name of the menu or by pressing the **ALT** key and then the first Letter of the menu name.



Block Edit

The block selected in the block listing will be displayed in the block editor and is ready for any changes. The keyboard shortcut **F10** provides the same function.



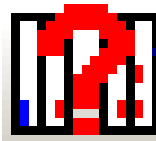
Symbolic Table Editor

With this easy to use integrated editor you can write, cut, copy and paste text to create and modify the symbol table. The symbol table may be tested for multiple uses of addresses or symbols. The symbol table can also be sorted by addresses or symbols.



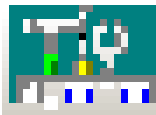
PLC Error Display (I-Stack, B-Stack, Diagnostic Buffer)

This icon enables you to view the program interrupt information stored in the PLC (I-Stack, B-Stack, Diagnostic Buffer). The information is displayed in real language with the faulty portion of the program.



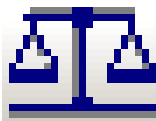
On-line PLC Status

The status of flags, inputs, outputs, timers, counters, comparators, data words, and peripheral words are displayed and can be modified.



Preferences

This icon opens dialog boxes to customize the appearance of *S5 for Windows®*. The settings for the serial port, the editors, the indexes, the display font and other (miscellaneous) settings are saved and are reloaded whenever a new PLC project is opened.



PLC Block (Program) Compare

S5 for Windows® offers a powerful PLC Program (Block Compare). The command **Compare** opens dialog boxes to select PLC Program files to compare (online and offline).



S7 Hardware configuration

Only available with *S7 for Windows®*. Not used with STEP 5 PLC programs.



Dynamic PLC Block Display

Enables fast switching between open PLC status windows.



Closing Open Windows

The *S5 for Windows®* active window is closed by clicking this icon. The keyboard shortcut **Ctrl+F4** provides the same function.



Help Function

An integrated, subject related help file with an index and a list of keyboard shortcuts for easy operation is available. The keyboard shortcut **F1** provides the same function.

Tool bar II (PLC Block List)

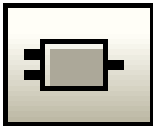


The tool bar II provides instant access to frequently used PC block list commands. Click an icon with the mouse and the command is executed. With the keyboard you can reach these functions via the file menu and the Block menu.



Create new PLC Block

A dialog box to establish the name of the new block is opened. After entering the new Block, the Block Editor window is opened and ready for creating a new Block.



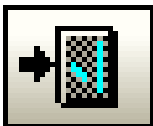
Edit Block

The block selected in the block listing will be displayed in the block editor and is ready for any changes. The keyboard shortcut **F10** provides the same function.



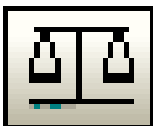
Print Block

The marked block is printed. The keyboard shortcut **Alt+B, R** provides the same function.



Transfer Block to PLC

The marked blocks are transferred to the PLC. The keyboard shortcut **Alt+B, T** provides the same function.



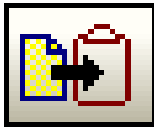
PLC Block Compare

The marked Block is compared with the Block in the (online and offline compare).



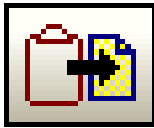
Cut Block

The marked blocks are transferred to a temporary buffer and are removed from the Block List. The keyboard shortcut **Ctrl+X** or **Shift+Backspace** provides the same function.



Copy Block

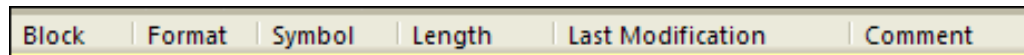
The marked blocks are transferred to a temporary buffer and remain in the Block List. The keyboard shortcut **Ctrl+C** or **Ctrl+Insert** provides the same function.



Paste Block

The blocks currently in the temporary buffer are transferred to the PC block list. The blocks remain in the temporary buffer. The keyboard shortcut **Ctrl+V** or **Shift+Insert** provides the same function.

Workplace Column Title Bar



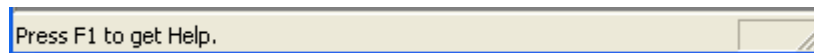
Clicking the title of a column will sort the PC Block List information in an ascending order. Clicking the title again will sort the information in a descending order.

The column width can be adjusted by dragging the column border with the mouse.

Workplace

All the blocks of an open PLC program file are listed in the PC block List. Additional application windows fill out the workplace.

Status Bar



The status bar may displays additional information on the open window and executed tasks.

Note:

The **right mouse button** may be used within the Workplace.

If the **right mouse button** is clicked, a menu with the most important commands is opened.

1.3 Generating a S5 Project

A new S5 Project can only be generated in an existing Folder.

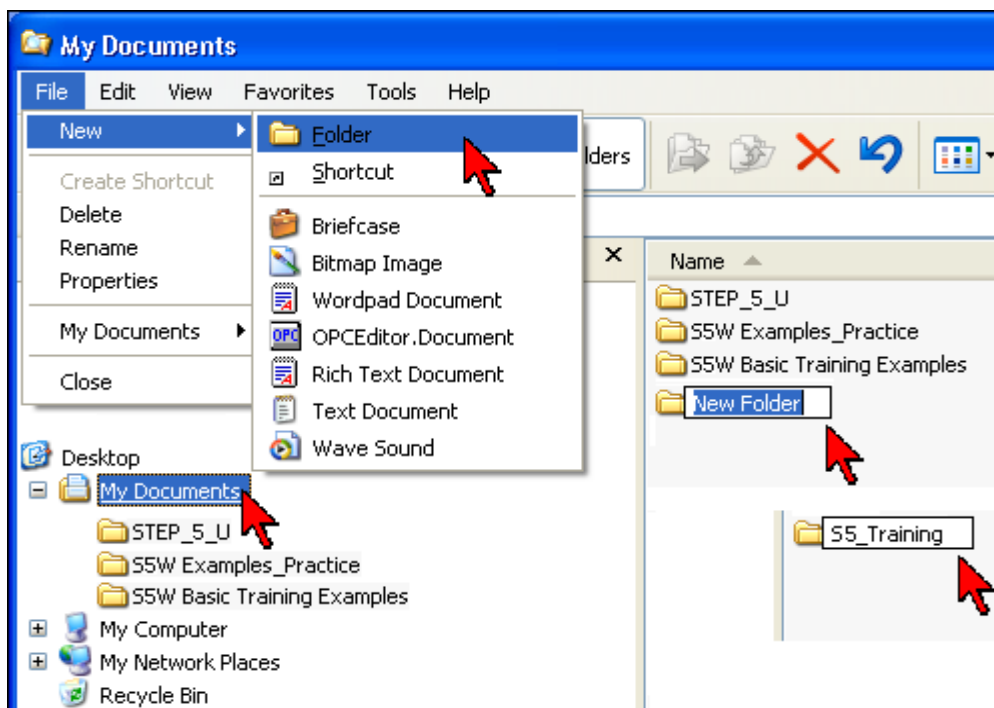
Note:

To “debug” a PLC program located in the PLC, you have to have the PLC program located in a S5 Project. This could be the original project with comments and symbols (preferable).

If the original project is not available you must download the PLC program into a newly generated S5 Project.

It is not recommended that you generate a new project directly in the “My Documents” folder. You can name a new folder and put it in the “My Documents” folder, for instance “S5_Training”.

Generate a new “S5 Project” folder



Note:

Windows with “**Offline – information**” have a light yellow background.

Note:

Windows with “**Online – information**” have a light green background.

Commands to open a new project

S5 for Windows® provides two possibilities to generate S5 projects:

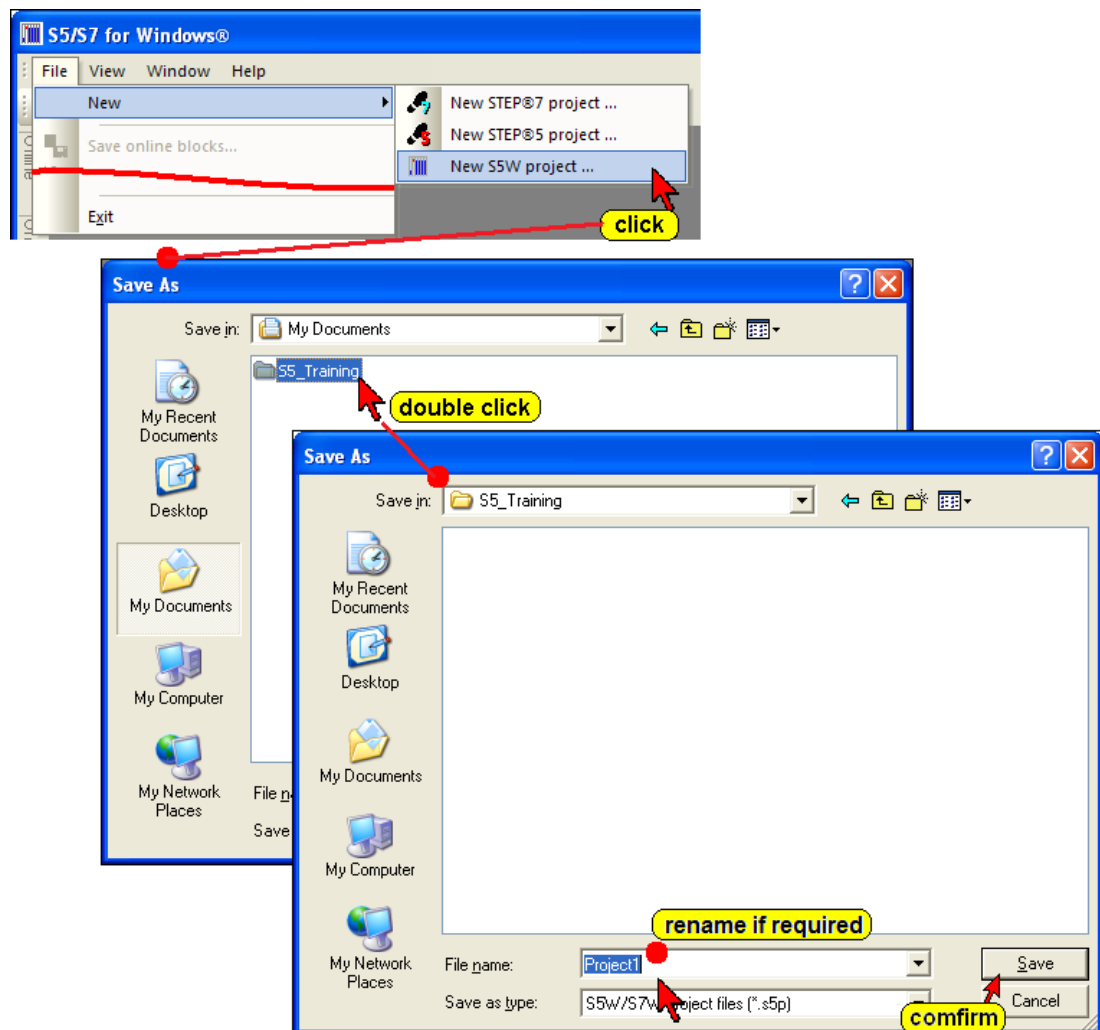
- New STEP® 5 project.
- New S5W project.

It is recommended that you use “**New S5W project**”. More details about the PLC Programs and Blocks can be saved in a S5W project.

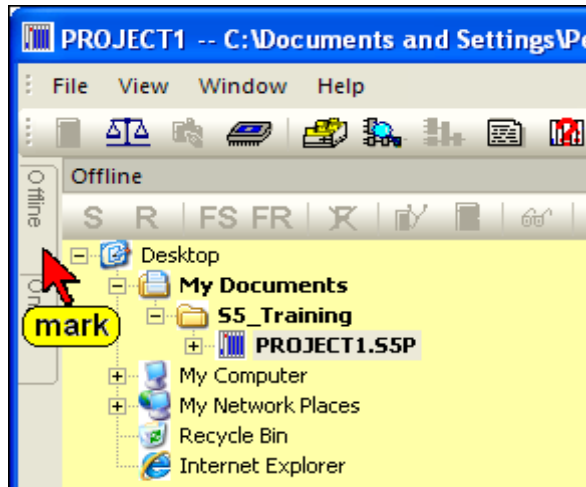
Use “New STEP® 5 project” only if you are frequently using the original Siemens STEP 5 programming software.

The following t explains the handling of a “**New S5W project**”.

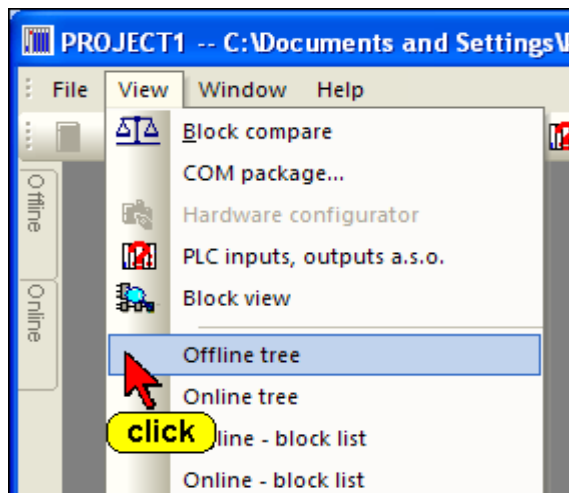
- Click “New S5W project” in the File / New Menu.
- Select the “Path” in the “Save As” dialog box.
- Rename the S5 project in the “File name” field (Project1) if required and confirm with the “Save” button.



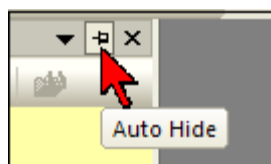
The S5W project with its name “PROJECT1” is listed in the “Offline – Tree”.



If the “Offline” tab is not shown, use the command “Offline tree” from the “File” menu.



It is recommended that you use the “Auto Hide” icon to lock the tab at the outside border of S5 for Windows®. By moving the mouse pointer to the tab the window will open automatically.

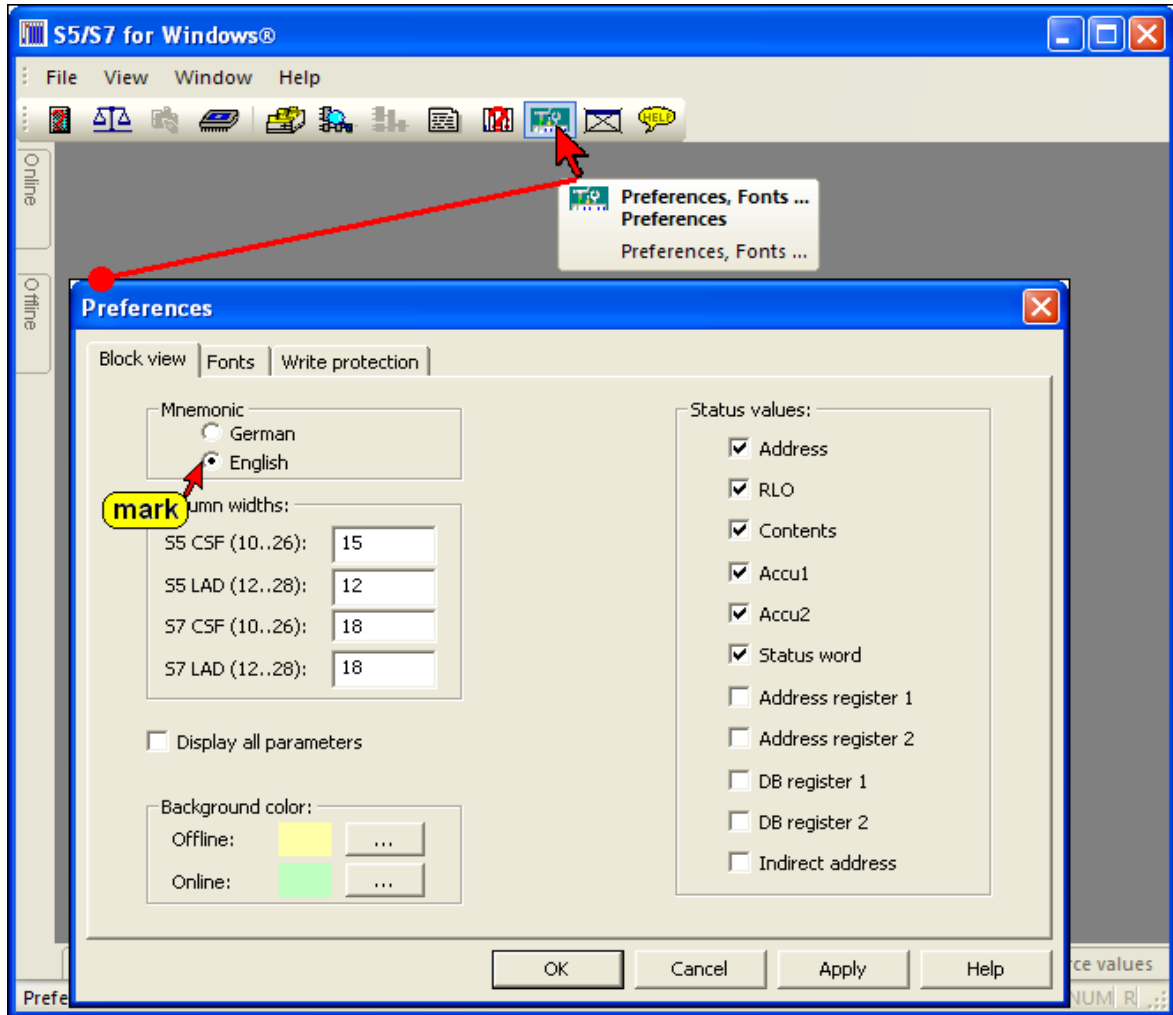


Note:

A “Project” is required to make a PLC user program. You also must have an open project to transfer and save an existing program from a PLC for backup purposes.

1.4 Selecting the English Mnemonics

In the US, PLC programs are usually using English Mnemonics.



The selection changes the mnemonics of the instructions (key words) and the operands in the logic and the symbolic table. The selection will not change the language of the program (menu commands, symbols, comments, etc.).

The mnemonics to identify Bit-Memory, Timers, Counters, Inputs, Outputs, and the instruction set used for Statement List (STL) programming are identified with their English (International mnemonics) syntax.

Examples:

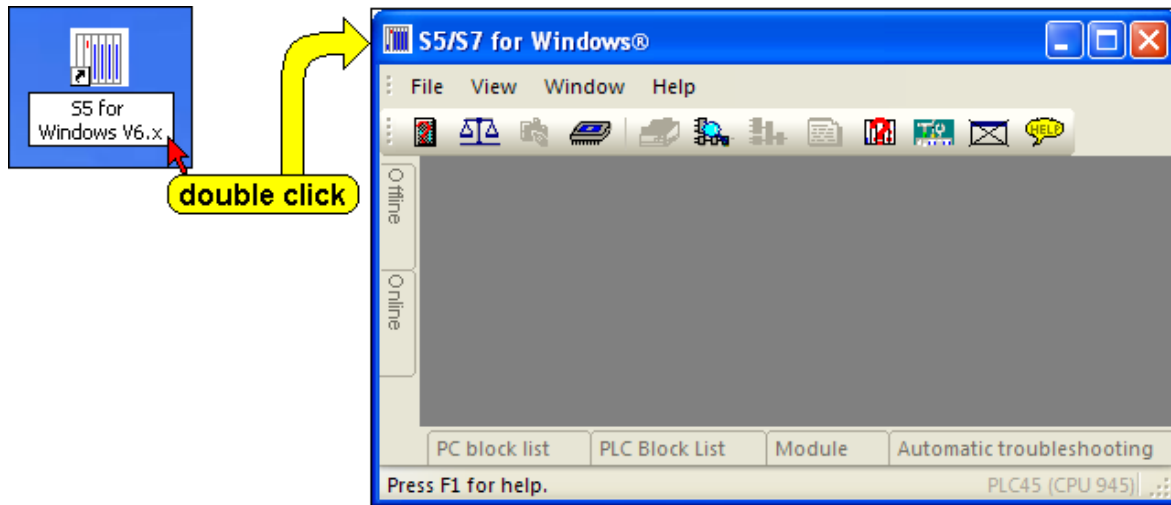
Input	I	Timer	T	OR	O
Output	Q	Counter	C	Count Down	CD
Flag	F	AND	A	Count Up	CU

1.5 S5 for Windows® Basic Window (Standard interface)

Note:

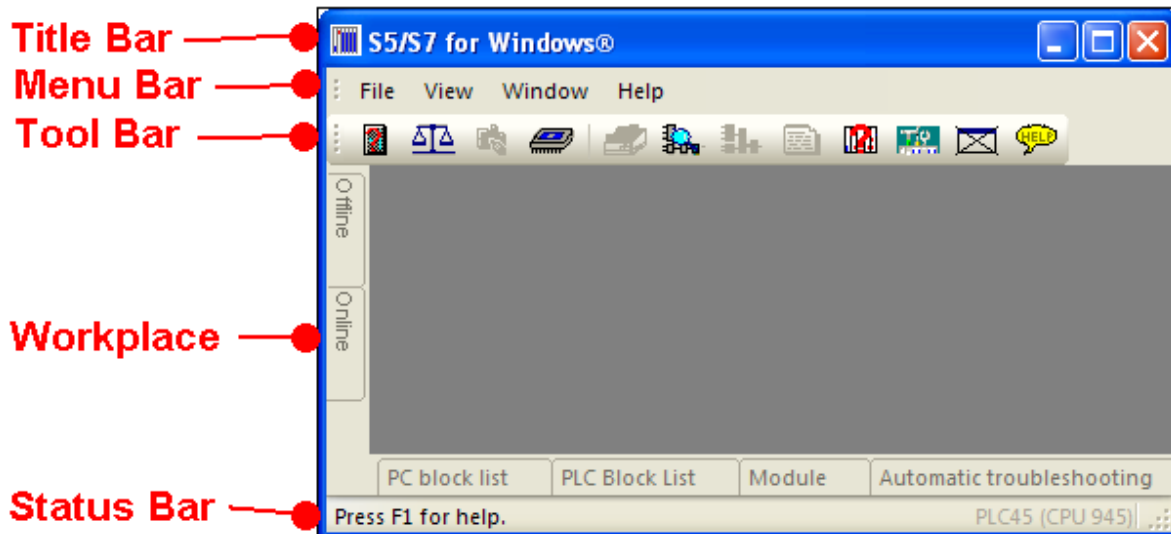
If you are not familiar with S5 for Windows® we recommend that you use the “Classic operator interface” (see chapter 1.2).

Opening the S5 for Windows® Software



During the installation of S5 for Windows® an icon has been inserted. Double click the icon “S5 for Windows®” to start the programming system.

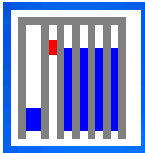
S5 for Windows Basic® Window



Title Bar



The title bar displays *S5 for Windows®*, and, if an additional Window is open in the workplace, the name of the open window is also displayed. The Icons are “Windows” specific.



Open Control menu

This icon opens the Control menu that contains the commands to Restore, Move, Size, Minimize, Maximize, or Close the open Window. The Keyboard shortcut is Alt + Spacebar.



Minimizing the open window to an icon

Clicking the button at the right side of the S5 for Windows title reduces the open window to the size of an icon (same function as the **Minimize** command from the Control menu).



Maximizing the open window

Clicking the Maximize button in the upper right corner of S5 for Windows will enlarge the window to its maximum size (same function as the **Maximize** command from the Control menu).



Restoring an enlarged window to its previous size

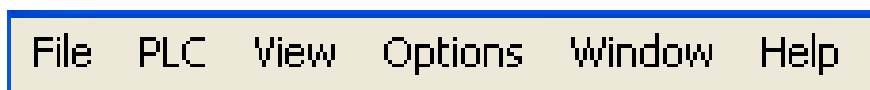
Clicking the Restore button in the upper right corner of S5 for Windows will restore an enlarged window to its previous size (same function as the **Restore** command from the Control menu).



Closing S5 for Windows

Clicking the Close button in the upper right corner of S5 for Windows will terminate S5 for Windows (same function as the **Close** command from the Control menu).

Menu Bar



The menu bar contains a list of menus. You can open a menu by clicking the name of the menu or by pressing the **ALT** key and then the first Letter of the menu name.

Tool Bar – Standard Operator Interface



The tool bar provides instant access to frequently used *S5 for Windows®* commands. This tool bar is the same for all *S5 for Windows®* application windows. Click an icon with the mouse and the command is executed. You can reach these functions with the keyboard via the window menu and/or the function keys.



CPU Function (I-Stack, B-Stack, Diagnostic Buffer)

This icon enables you to view the program interrupt information stored in the PLC (I-Stack, B-Stack, Diagnostic Buffer). The information is displayed in real language with the faulty portion of the program.



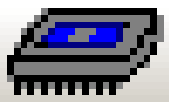
PLC Block (Program) Compare

S5 for Windows® offers a powerful PLC Program (Block Compare). The command **Compare** opens dialog boxes to select PLC Program files to compare (online and offline).



S7 Hardware configuration

Only available with *S7 for Windows®*. Not used with STEP 5 PLC programs.



EPROM / EEPROM / Flash EPROM Burner

This icon opens a menu to control EPROM / EEPROM / Flash EPROM burning. It is only active when the EPROM burner option has been purchased.



Cross Reference Display

A click on this icon lists the appearance of operands as a symbol or absolute throughout the whole program. This function may be called from any window.



Dynamic PLC Block Display

Enables fast switching between open PLC status windows.



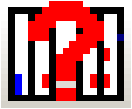
Block Edit

The block selected in the block listing will be displayed in the block editor and is ready for any changes.



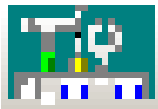
Symbolic Table Editor

With this easy to use integrated editor you can write, cut, copy and paste text to create and modify the symbol table. The symbol table may be tested for multiple uses of addresses or symbols. The symbol table can also be sorted by addresses or symbols. The keyboard shortcut F6 provides the same function.



On-line PLC Status

The status of flags, inputs, outputs, timers, counters, comparators, data words, and peripheral words are displayed and can be modified.



Preferences

This icon opens dialog boxes to customize the appearance of *S5 for Windows®*. The settings for the serial port, the editors, the indexes, the display font and other (miscellaneous) settings are saved and are reloaded whenever a new PLC project is opened.



Closing Open Windows

The *S5 for Windows®* active window is closed by clicking this icon. The keyboard shortcut Ctrl+F4 provides the same function.



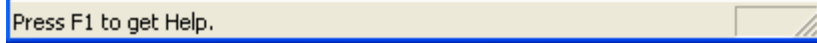
Help Function

An integrated subject related help file with an index and a list of keyboard shortcuts for easy operation is available. The keyboard shortcut F1 provides the same function.

Workplace

Additional application windows fill out the workplace.

Status Bar



Press F1 to get Help.

The status bar may displays additional information on the open window and executed tasks.

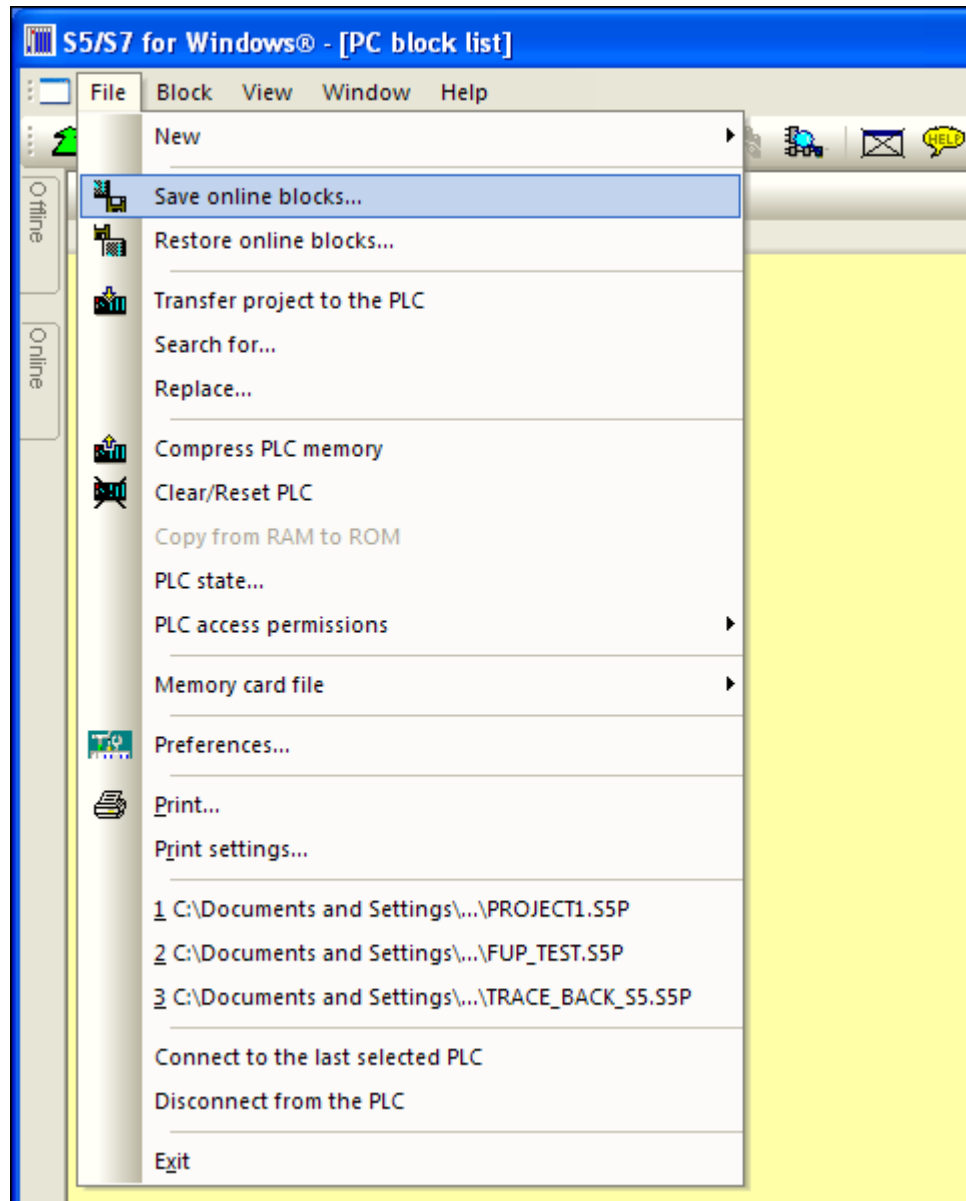
Note:

The **right mouse button** may be used within the Workplace.

If the **right mouse button** is clicked, a menu with the most important commands is opened.

1.6 File (File Menu - PC Block List)

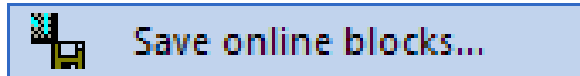
The commands in the File Menu control the opening and saving of projects (files). Your personnel preference settings as well as the printing and documentation layouts are also controlled by the commands from this menu. Basic online debug functions are also available.



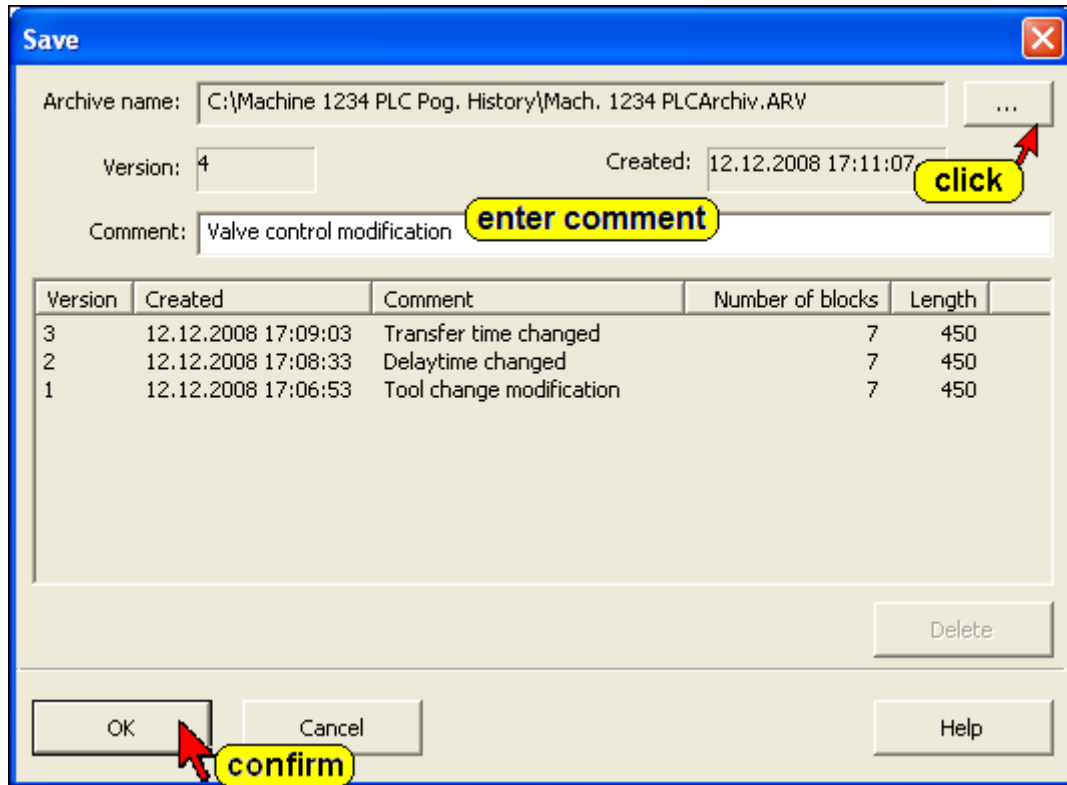
New (New Project)

The **New** command is used to create a new project. An additional menu is opened to select the type of project (see Chapter 1.3 Generating a S5 Project).

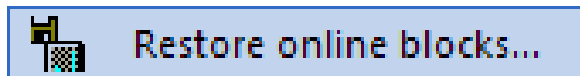
Save Online Blocks



The PLC Blocks in the connected online PLC can be saved in an archive file (compressed). A dialog box is opened where you can select the **Archive Name** and the path to save the archived PLC program. This command is used to backup PLC programs and save the different versions (Backup History).

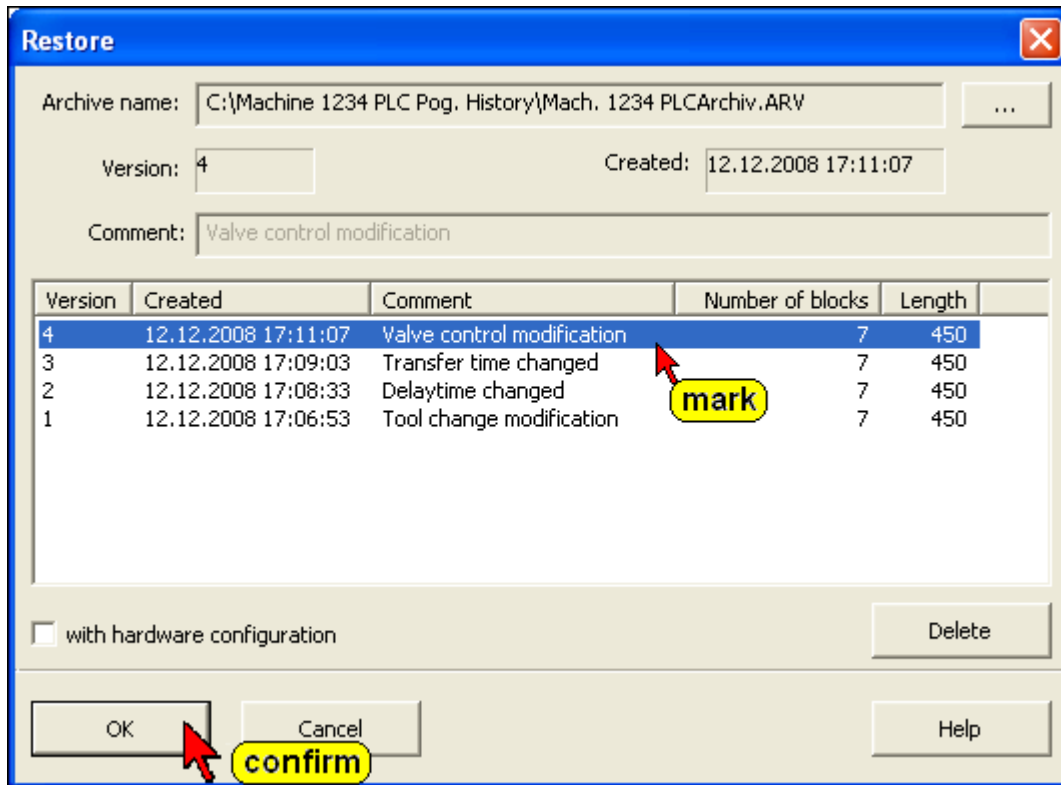


Restore Online Blocks

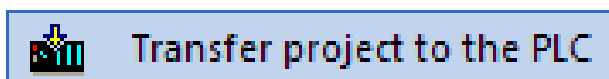


The archived PLC Programs saved in the PC (different versions – backup History) are listed. The marked archived PLC Program can be transferred to the connected online PLC. This program will replace PLC program inside the PLC.

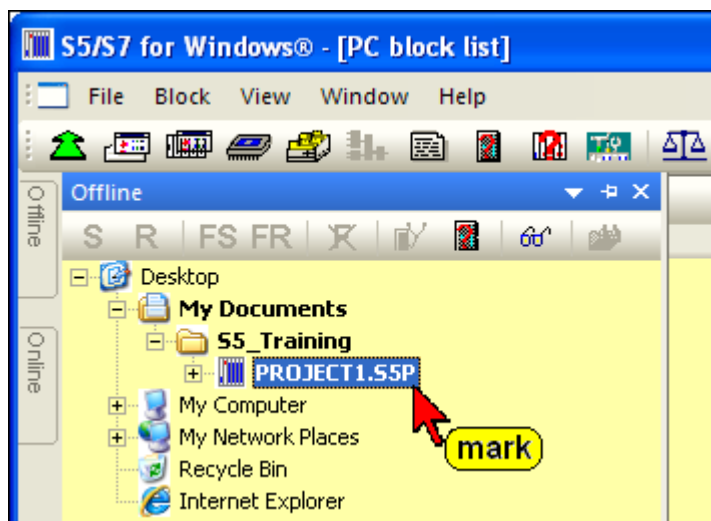
Restore Online Blocks



Transfer Project to the PLC



The PLC Project marked in the “Offline Tree” is transferred to the connected online PLC.

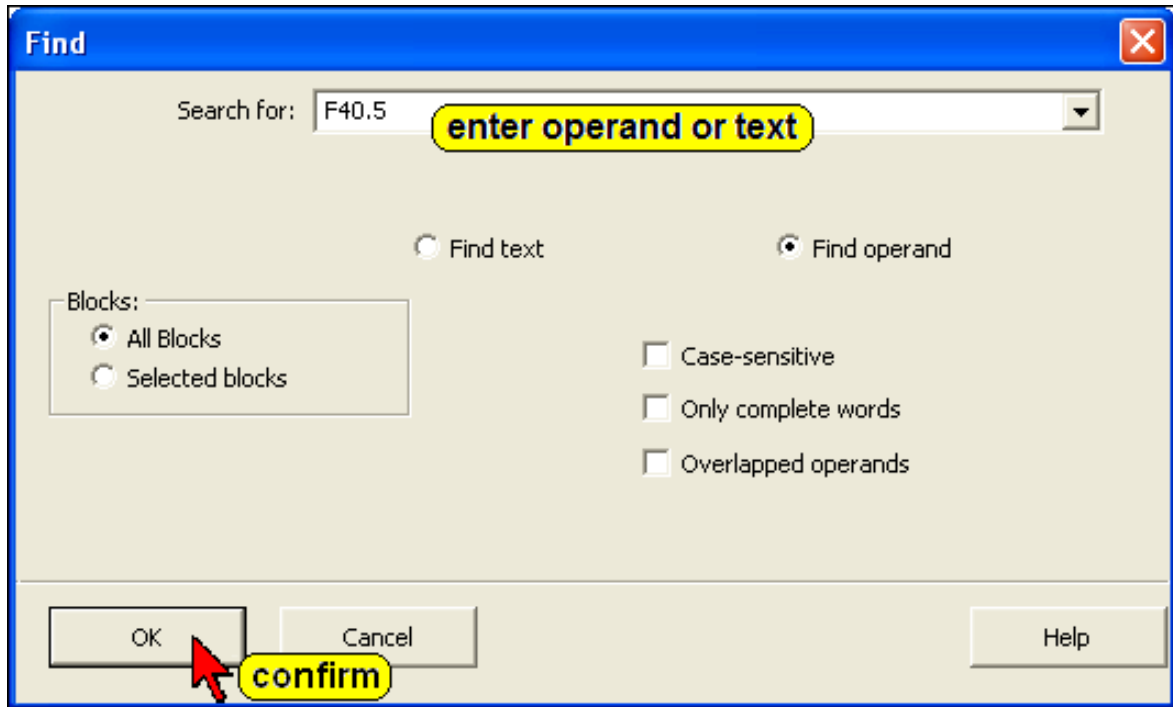


Prior to overwriting a Block a warning is displayed to allow or cancel the overwriting.

Search For

Search for...

A dialog box is opened providing the tools to search for an operand or text within a PLC Block or within the whole PLC program. This feature works only with the offline S5 project.



The result is shown in the “Search result” window.

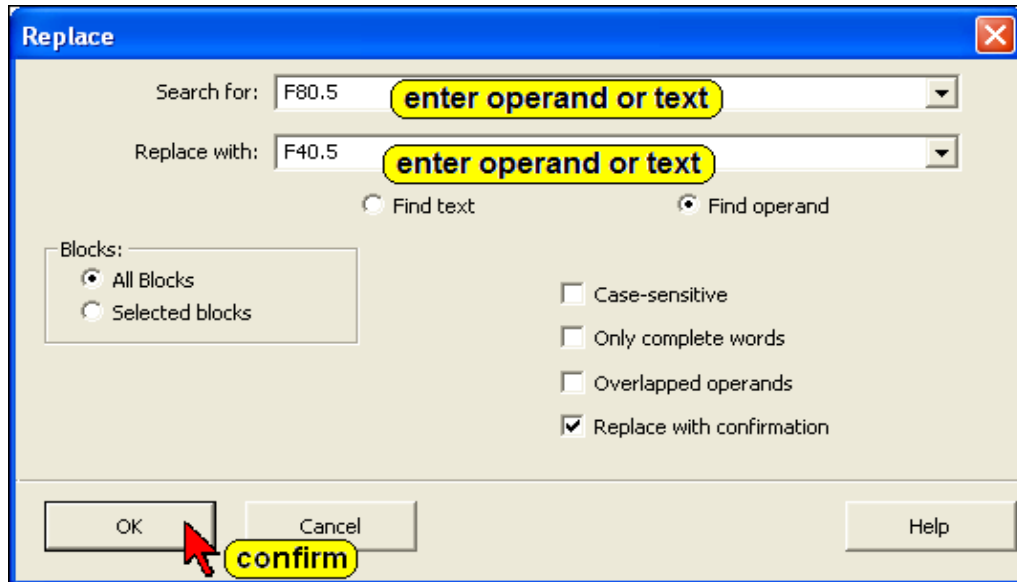
Symbol	Address	Comment	Block	Segment	Position	Access
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 2	2	5	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 2	3	2	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	1	2	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	3	2	writing
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	3	5	writing
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	4	1	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	4	3	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	5	0	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	6	6	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	7	0	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	8	0	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	9	0	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	10	3	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	11	0	reading
F40.5	F 40.5	1-LOADING CYCLE IN PROGRESS	PB 12	12	0	reading

Double clicking a line or using the right mouse button will open the editor window displaying the Block and Segment of the selected operand.

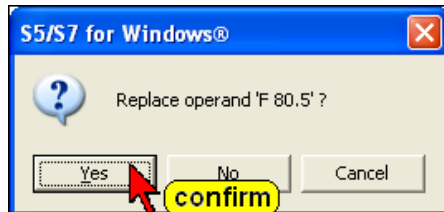
Replace

Replace...

A dialog box is opened providing the tools to replace an operand or text within a PLC Block or within the whole PLC program. This feature works only with the offline S5 project.



If “Replace with confirm” is marked a field is open to allow or not each replacement or cancel the replacement completely.



Compress PLC Memory

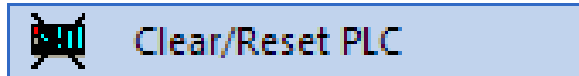


Compress PLC memory

Deleting blocks in the PLC does not remove these blocks from the PLC memory. The deleted blocks still occupy space in the memory. If blocks with the same name are transferred to the PLC, the old block remains in the PLC and occupies space in the PLC memory. The **Compress** command, from the PLC menu, reorganizes the PLC memory. All the unused blocks are deleted. After executing this command only usable blocks remain in the PLC memory.

The compress function does not work in the RUN mode.

Clear / Reset PLC



Overall Reset; Erasing the Program Memory and Resetting the CPU

Before downloading a new program to the S5 programmable controller (PLC) a memory reset on the CPU should be performed to ensure that no "old" blocks and information are still in the CPU.

Overall Reset deletes the following:

- PLC program memory
- All data (flags, S flags, timers and counters)
- All error IDs.

In addition, all system data is automatically assigned default values after "Overall Reset" so that the system data area assumes a defined "basic status".

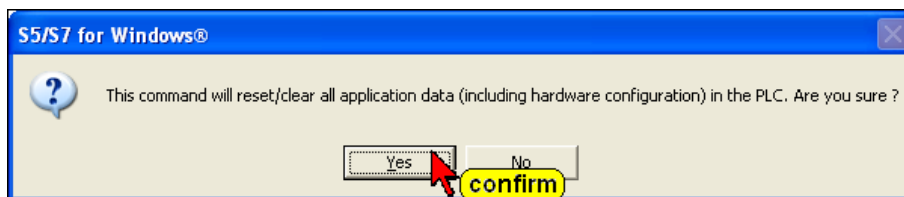
The extended system data area (RT) is not deleted.

There are two ways of deleting the internal program memory:

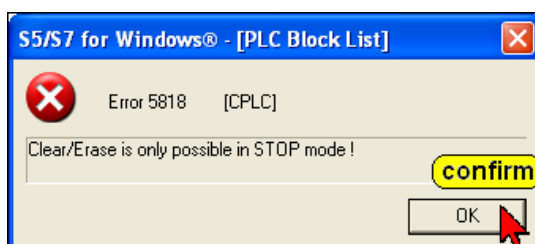
- Offline via the switch for "Default/Overall Reset"
- Online with the "Delete" programmer function.

Click the command "**Clear / Reset PLC**" in the File menu.

To ensure that the command "**Clear / Reset PLC**" is not accidentally executed a warning is displayed. Confirm the warning.



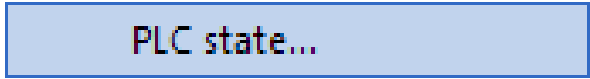
If the CPU is not in the Stop mode a message is displayed and the command "**Clear / Reset PLC**" will not be executed.



Copy from RAM to ROM

This command is only available with S7 PLC's,

PLC State

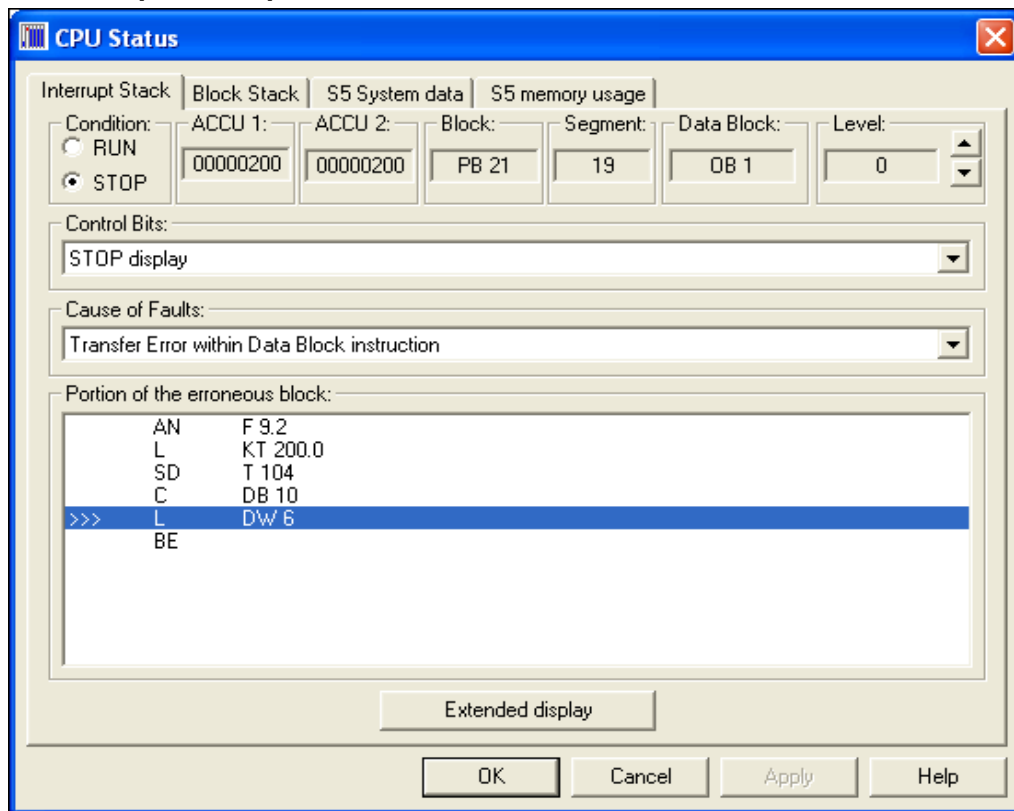


Several online displays are provided to display the status of the PLC.

If the PLC is running only "S5 System Data" and "S5 Memory usage"

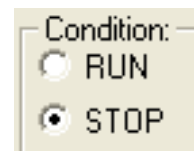
If the PLC is in a stop condition, the Interrupt Stack (I-Stack) and the Block Stack (B-Stack) will display the reasons for the stop condition.

Interrupt Stack (I-Stack)



RUN

The PLC is in a RUN condition. Clicking the button puts the PLC into a RUN condition.

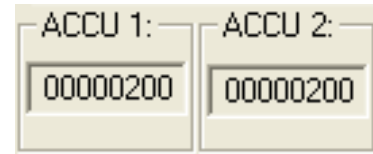


STOP

The PLC is in a STOP condition. Clicking the button puts the PLC into a STOP condition.

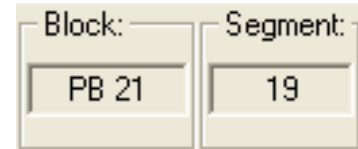
Register (ACCU's)

The contents of accumulators 1 and 2 are displayed in hexadecimal form. The contents of the additional accumulators, 3 and 4 (certain S5 CPU's only) are displayed in the Extended Interrupt Stack display



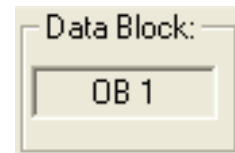
Block and Segment

The block and the Segment where the PLC program was interrupted (stop condition) is displayed.



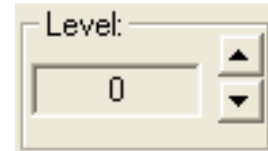
Data Block

If a data block (DB) was active when the PLC program was interrupted, the data block number will be displayed.

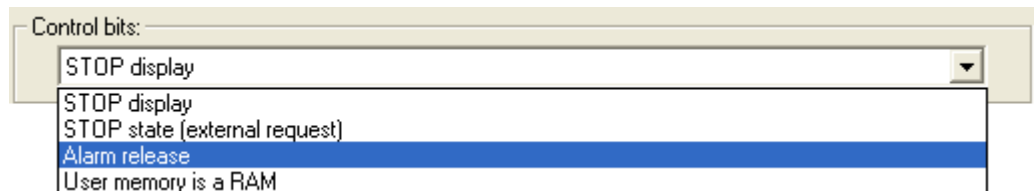


Level

Some S5 CPU's provide different interrupt stack levels. Buttons are provided to switch between the levels of the I-Stack.

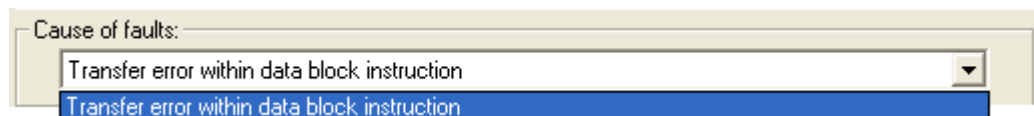


Control Bits



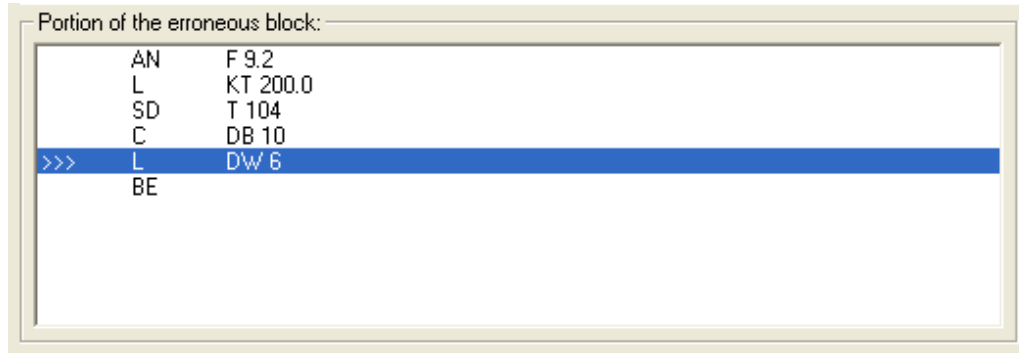
A pull down list field is provided to display the control bits in a man-readable form.

Cause of Faults



A pull down list field is provided to display the faults in a man-readable form

Portion of Erroneous Block



A pull down list field is provided to display the portion of the PLC where the fault occurred. The statement where the PLC went into a STOP condition is displayed with a blue background.

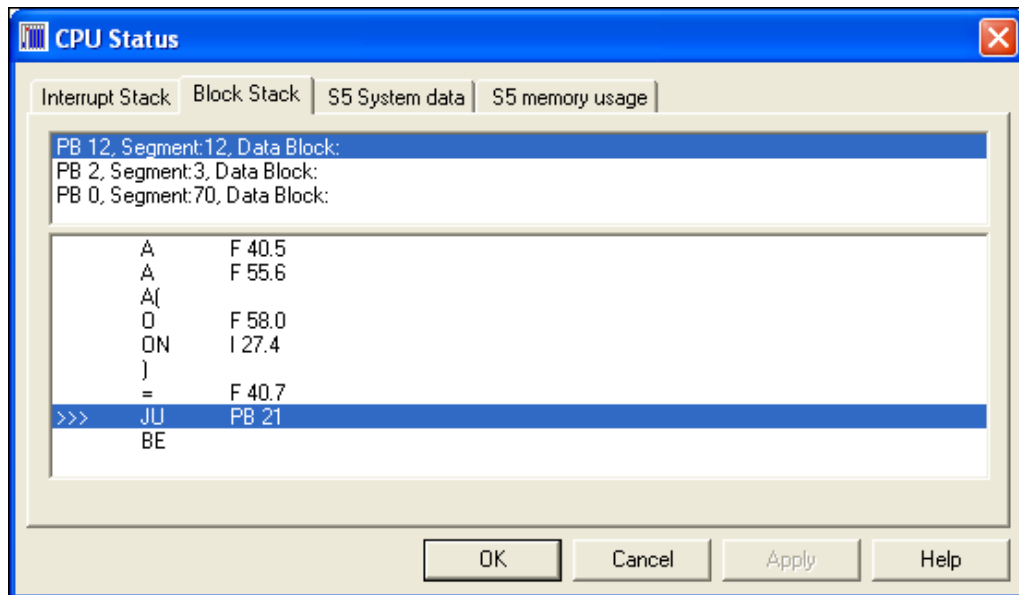
Extended Display

A button is provided to switch to extended interrupt stack.



Block Stack (B-Stack)

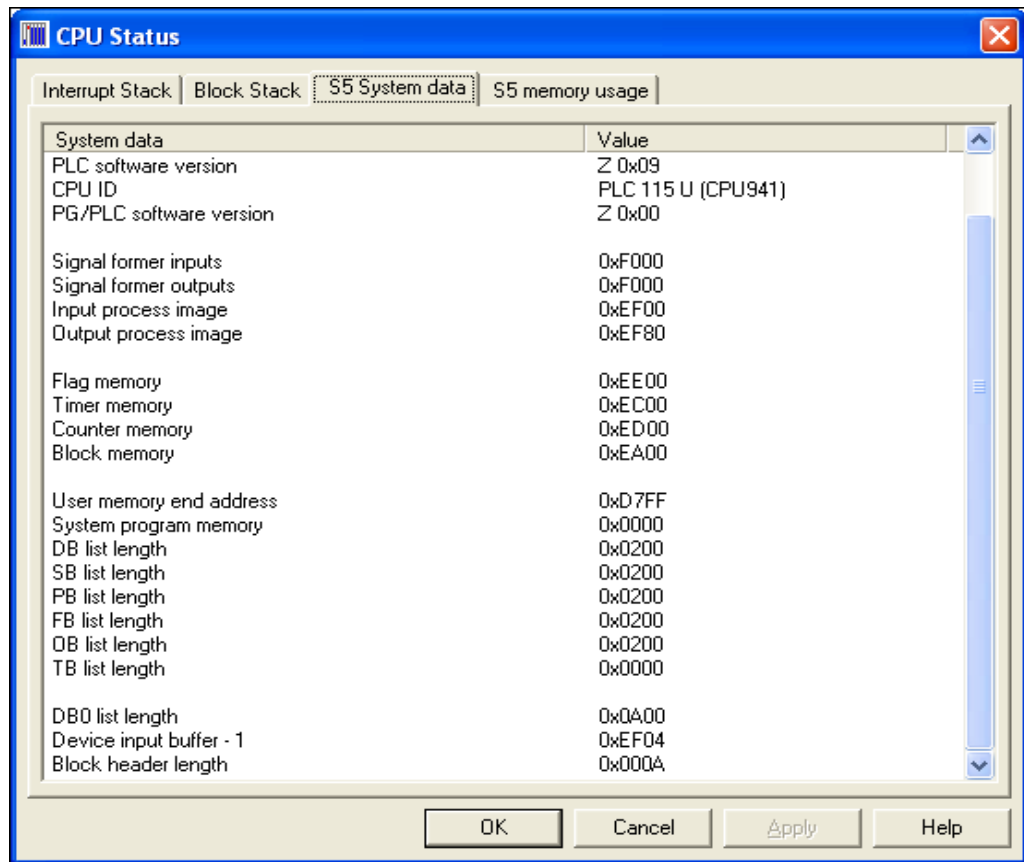
During the program execution the jump instructions enter data in the block stack. The block where the jump (block call) originated and the following locations are listed. The block stack lists all the blocks that that were called but had not been completely processed prior to the CPU going into its STOP mode.



Details are displayed about the selected block (segment). Mark the Block that you want details on.

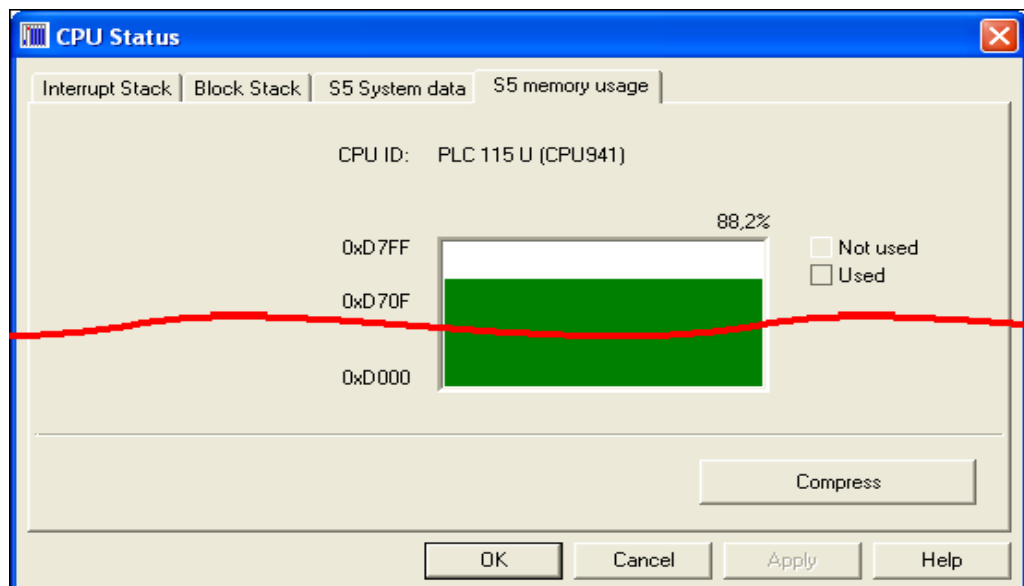
S5 System Data

The System Data of the online connected CPU is displayed. The “System Data” and its value is CPU specific.



S5 Memory usage

The used memory with its absolute addressing is displayed. A button is provided to compress the memory.



S5 Extended Interrupt Stack (Extended display – I-Stack)

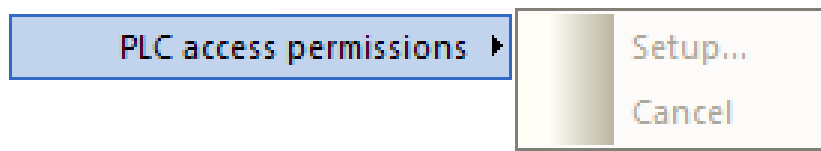
Depending on the fault and the type of the S5 CPU, additional information about the fault and the status of the CPU are displayed in the S5 Extended Interrupt Stack.

S5 Extended Interrupt Stack information

Mnemonics	Explanation
Depth	The nesting level is shown
BEF-REG	Statement register
SAZ (new)	Step address counter (new)
DB-ADR	Data block address
BA-ADR	Block address
BST-STP	Block stack pointer
Block	Block type and number
Level	Number of nesting levels
REL-SAZ	Relative step address counter

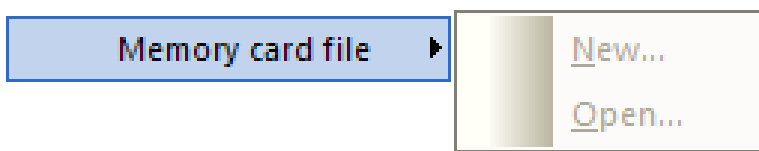
Mnemonics	Explanation (continued)		
DBL-REG	Data block register		
BS-REG	Block register		
Tile No.	Number of tiles		
SAZ (old)	Step address counter (old)		
UAMK	Interrupt display high word		
UALW	Interrupt display low word		
Brackets	Nesting stack entry 1 to 6 entered for A(and O(
anz1	0	0	1
anz0	0	1	0
	Accu 1=0 or 0 is shifted	Accu 1>0 or 1 is shifted	Accu 1<0
ovfl	Arithmetic overflow		
ovfls	Arithmetic overflow latched		
or	OR memory		
erab	First scan (negated signal)		
stat	Status of the operand of the last binary statement executed		
ROL	Result of logical operation		
ACCU 1-4	Contents of the accumulators 1 -4		

PLC Access Permission



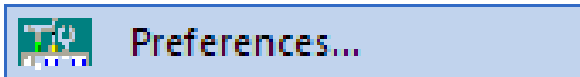
This command is only available with S7 PLC's.

PLC Access Permission



This command is only available with S7 PLC's.

Preferences

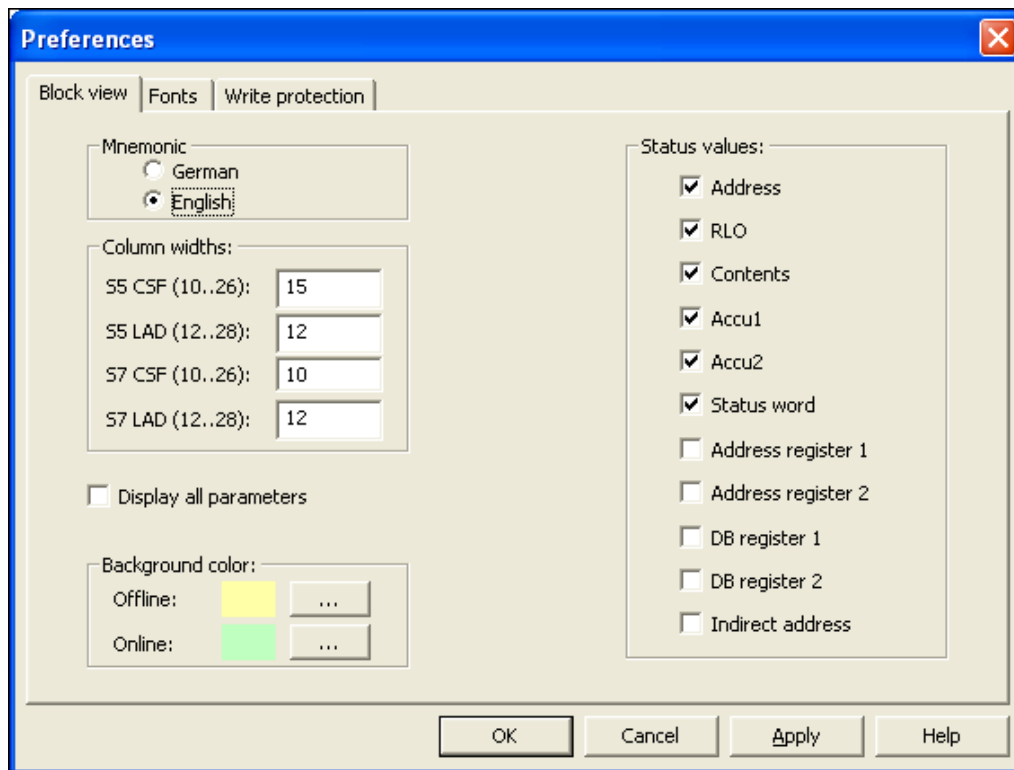


The **Preferences** command or clicking the icon opens the **Preferences** dialog box.

The dialog box is designed as a card file with tabs to separate the different subjects.

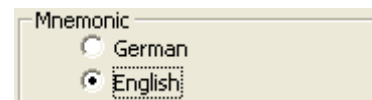
Each dialog box card offers buttons and command fields to setup the appearance of *S5 for Windows®*.

Block View Tab



Mnemonics

The language of the mnemonics you want to use can be set. The selection changes the mnemonics of the instructions (key words) and the operands in the logic and the symbolic table. The selection will not change the language of the program (menu commands, symbols, comments, etc.).



English Mnemonics

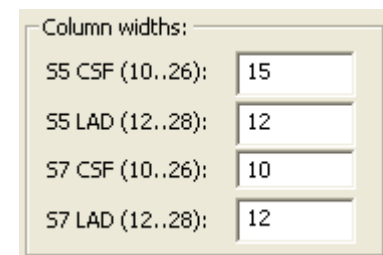
The mnemonics to identify Bit-Memory, Timers, Counters, Inputs, Outputs, and the instruction set used for Statement List (STL) programming are identified with their English (International mnemonics) syntax.

Example:

Mnemonics		
Name	English	German
Input	I	E
Output	Q	A
Flag	F	M
Timer	T	T
Counter	C	Z
AND	A	U
OR	O	O
Count Down	CD	ZR

Column Width

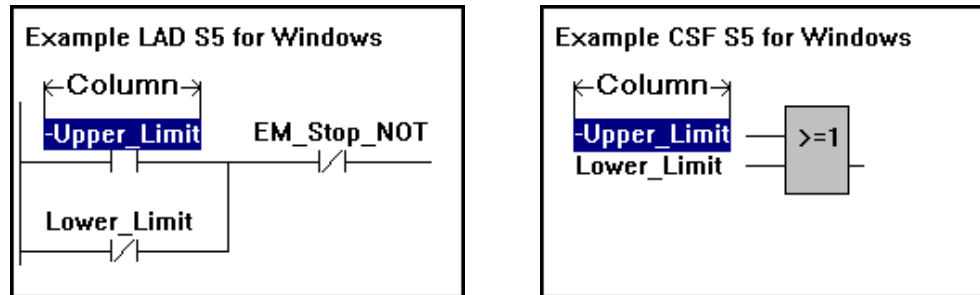
S5 for Windows® can display a symbolic operand with up to 24 characters (without a hyphen). To display symbolic operands with their full length name, the column width is adjustable. It is insured, that the operand is correctly identified even when the symbolic name is truncated in the display.



The column width is separately adjustable for the Control System Flowchart (**CSF**) and the Ladder Diagram (**LAD**) display. You can select a column width between 10 and 26 characters (including the leading hyphen) for the CSF display. LAD display allows a column width between 12 and 28 characters (including the leading hyphen).

The number entered as the column width is the number of characters spaces possible to display. The width of a character space varies with the font selected and does not always match the width of the other characters. Usually the number of space characters is slightly higher than the number of characters possible to be displayed in a given column width.

Column width example S5 for Windows®



Status Values

Address

In this column the memory addresses of the S5 instruction is displayed. The address displayed in the STL Status window online is the absolute addresses within the PLC RAM area.

RLO

In this column the Result of a Logical Instruction (RLO) of the instruction in that specific line is displayed.

Contents

In this column the Status Bit or the Contents of counters and timers is displayed.

ACCU1, ACCU2

In these columns the contents of the Accumulators are displayed. The accumulators are 16 or 32 bit general purpose registers and are used to process bytes, words, and double words.

Status Word

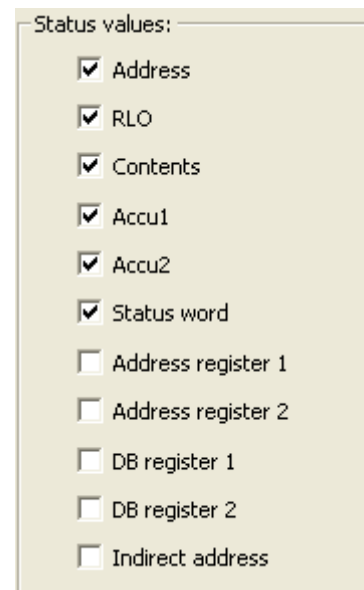
In this column the contents of the Status Word is displayed. The eight (8) lower bits of the 16 bit Status Word Register are showing detailed information about the instruction.

Address Register 1, Address Register 2

Only S7 CPU's have Address Registers.

DB Register 1, DB Register 2

The contents of the Data Block Registers are displayed in these columns. S5 CPU's only have one (1) Data Block Register.



Indirect Address

In this column the information about the indirect addressing in use are displayed (S7 CPU's only).

Note:

The more information you want to display in the **STL Status** window the longer it takes to build up the **STL Status** window. All information being displayed has to be transferred from the PLC to the PC.

Display all Parameters



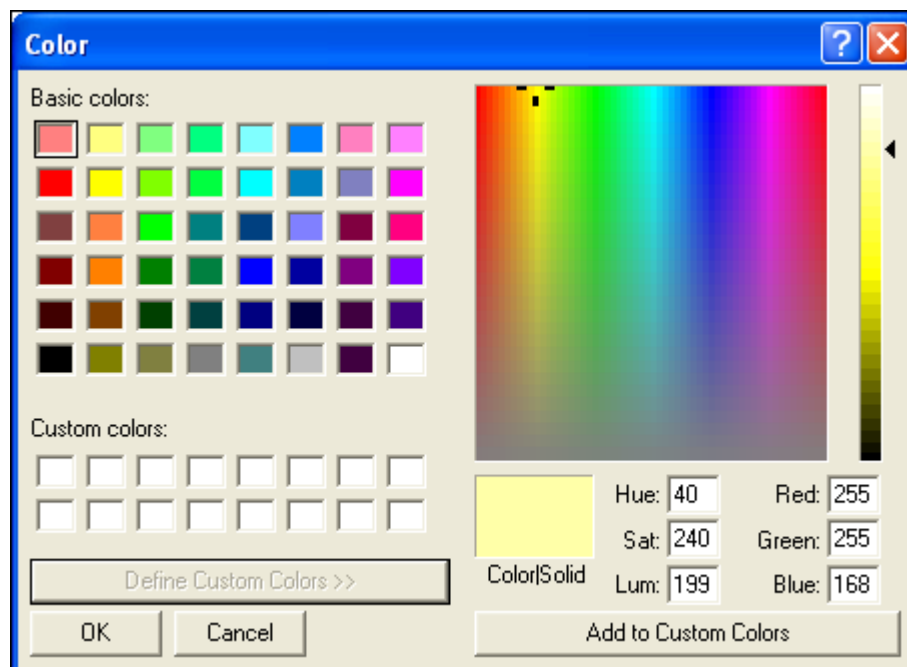
If selected all formal operands are displayed if calling a Function Block (FB).

Background Color

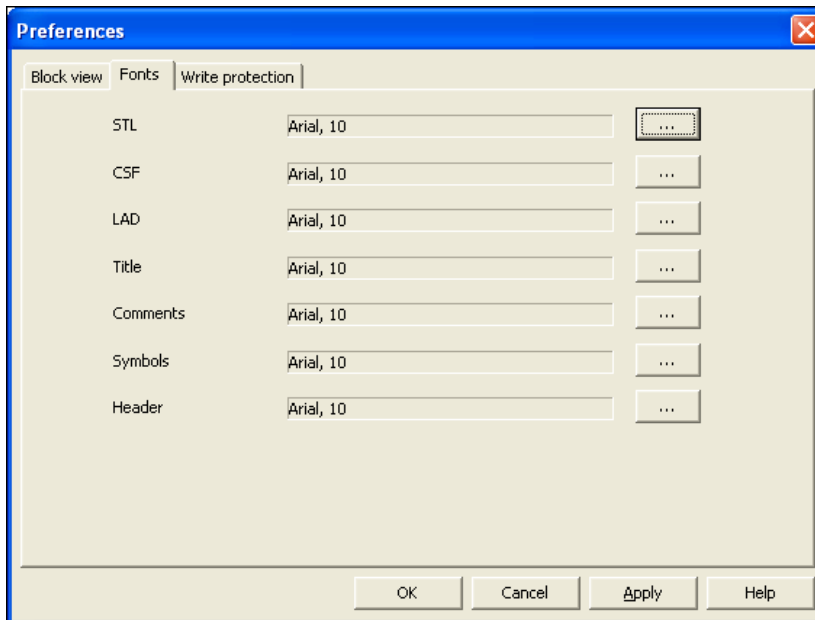
The default setting is that Windows with “**Offline – information**” have a light yellow background. Windows with “**Online – information**” have a light green background.



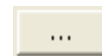
The color of the background can be changed. Clicking the button will open a dialog box to change the colors.



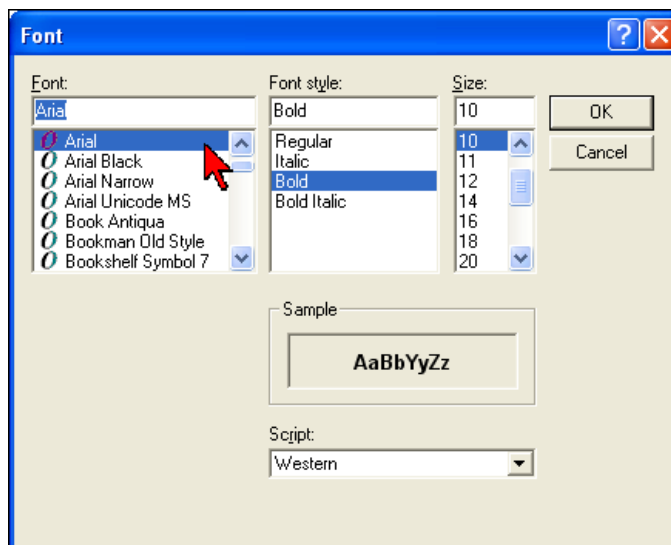
Fonts Tab



The font can be changed. Clicking the button will open a dialog box to change the fonts.



Different fonts may be assigned to various subjects for separation and a better reading. Also the font size and its style may be set.



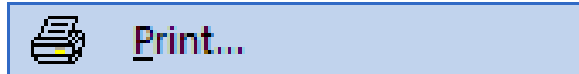
Note:

The font selection (done via the **Presentation Fonts** settings) is for the CRT display only. The fonts for the documentation printout are selected with the settings from the **Font Type** card of the **Documentation Layout** dialog box.

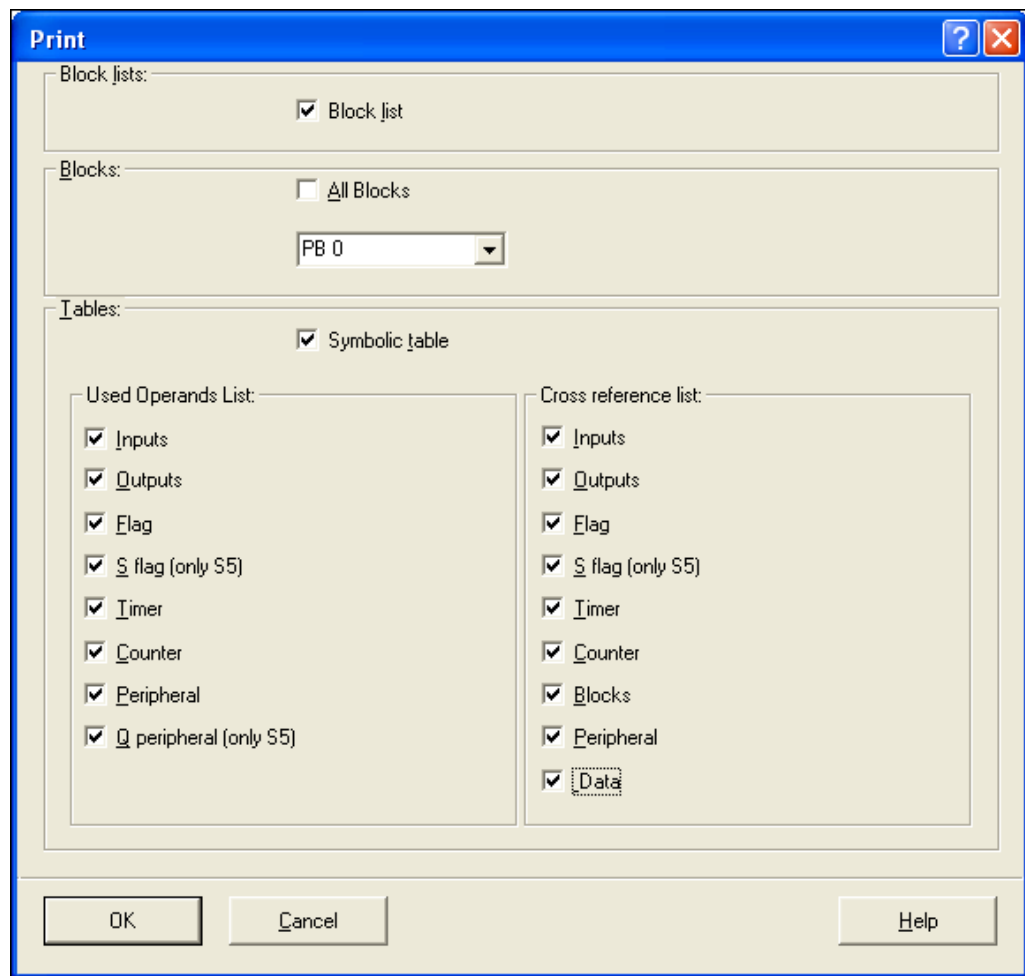
Write Protect Tab

With S5 for Windows® you can prohibit the online access to the PLC. The access can be password protected.

Print



The command **Print** opens the dialog box **Print**. The dialog box gives you the ability to select the items to be printed.



Block List

If the block list button is marked, a list is printed with the information displayed in the **PC Block List** window with the names of the blocks, their length, date and time of the last modification, and the comments that will be printed out.

Symbolic Table

If the symbolic table button is marked, the symbolic table will be printed out.

Used Operands List

The portions of the **Used Operands List** to be printed can be selected. You may mark one, several, or all operand groups to be printed in the used operands list. The used operands list is printed, showing the selected operands and where they are used (block and segment number) within the PLC program.

Cross Reference List

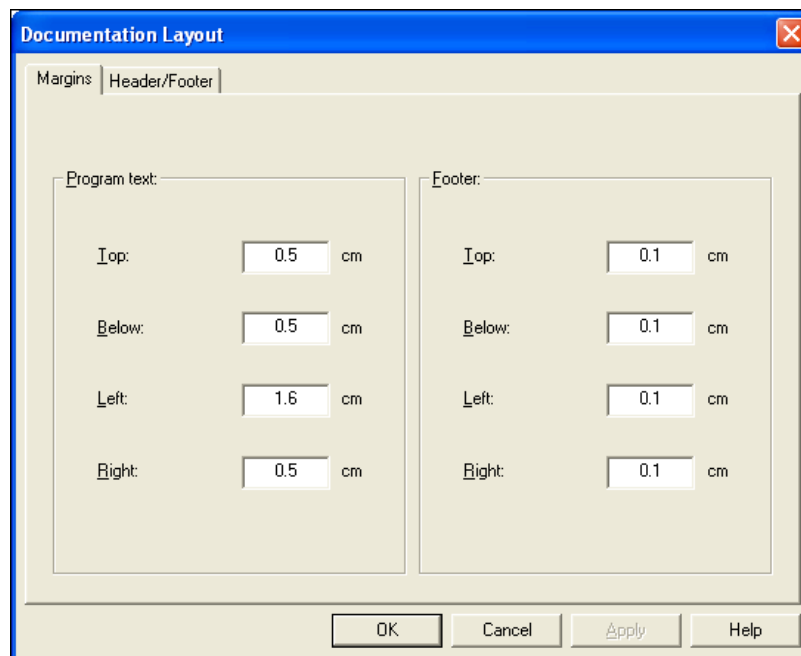
The portions of the **Cross Reference List** to be printed can be selected. You may mark one, several, or all operand groups to be printed the cross-reference list. The cross-reference list is printed showing the selected operands and where they are used (block and segment number) within the PLC program.

Print Settings

Print settings...

The **Print Settings** command or clicking the icon opens the **Documentation Layout** dialog box.

The dialog box is designed as a card file with tabs to separate the different subjects.

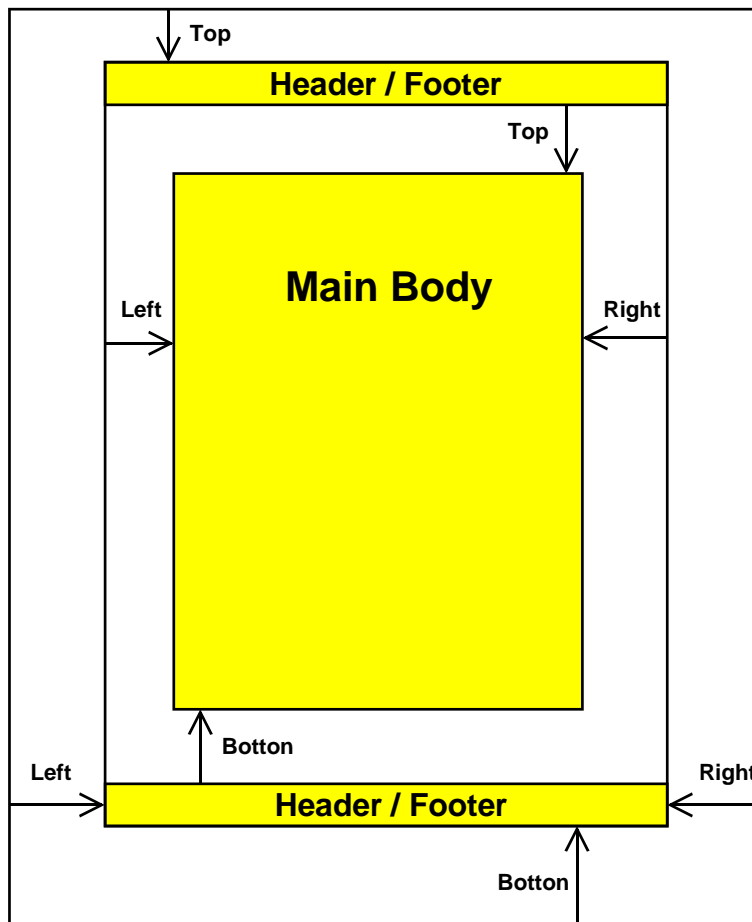


Margins Tab

Select the set margins dialog box to customize the page layout. The margins of the **Program Text** (Main Body – area where the PLC logic is printed) and the **Footer** (Header / Footer) are set independently. The dimensions are in centimeters (cm).

- The measurements must be entered in centimeter (cm).
- The margins for the header and the footer are measured relative to the page.
- The margins of the main body are measured relative to the header and footer (inside).

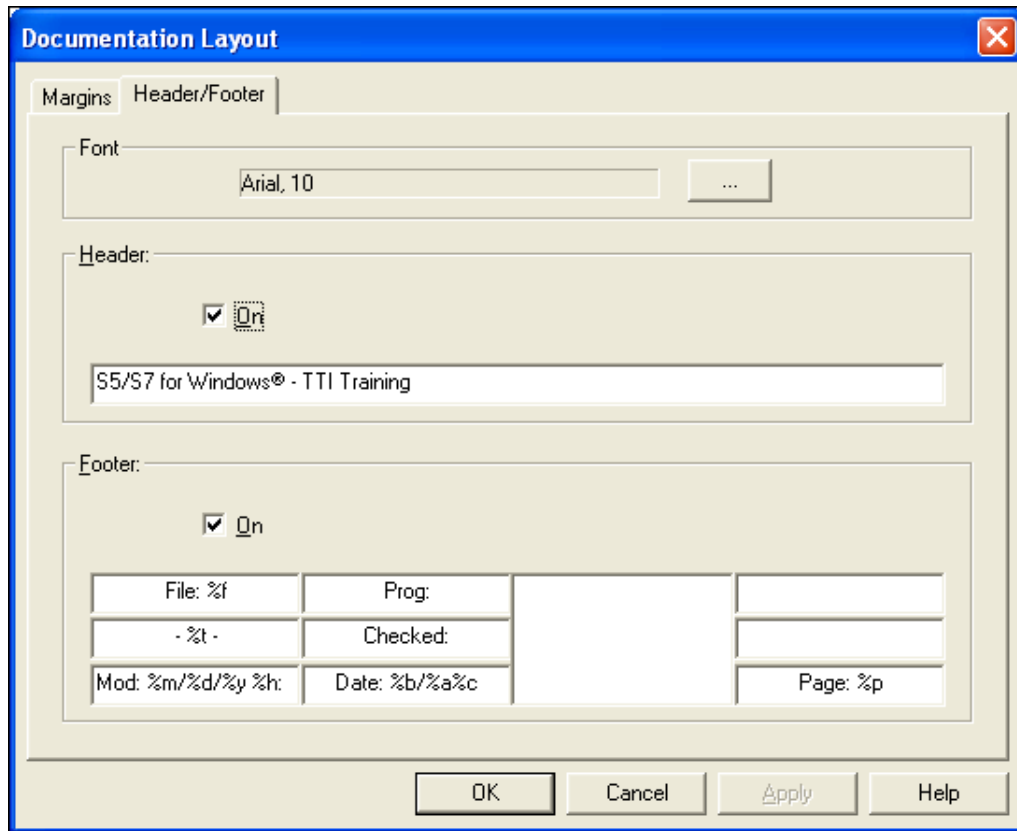
Page Layout Margins



The tab provides fields to customize the appearance of the page of documentation for the PLC program.

You may type any text in the text fields. There are field abbreviations available to assist you when entering PLC program information and date and time information to the header and footer. Buttons are available to disable the footer or header. The font for the header and footer may also be set.

Header / Footer Tab



Font

The font can be selected. Clicking the button will open a dialog box to change the fonts.



The font selections made in the **Fonts Type** settings box, are used for printing only.

Header

The tab provides a field (you may enable / disable the header) to customize the appearance of the page header of documentation for the PLC program. You may type any text in the text field.

Footer

The tab provides a field (you may enable / disable the footer) to customize the appearance of the page footer of documentation for the PLC program.

There are field abbreviations available to assist you when entering PLC program information and date and time information to the footer. You may type in addition to the abbreviations any text in the text field.

Footer Field abbreviations

%f	File name of the PLC program without file name extension.	
%t	List name (Title).	
%p	Page number.	
%a	Day	Printing date
%b	Month	Printing date.
%c	Year	Printing date.
%d	Day	File creation/modification date.
%m	Month	File creation/modification date.
%y	Year	File creation/modification date.
%h	Hour	File creation/modification date.
%l	Minutes	File creation/modification date.
%s	Seconds	File creation/modification date.

Connect to the last selected PLC

Connect to the last selected PLC

The last selected PLC online connection is established again (how to select and establish an online PLC connection see chapter 2).

Connect to the last selected PLC

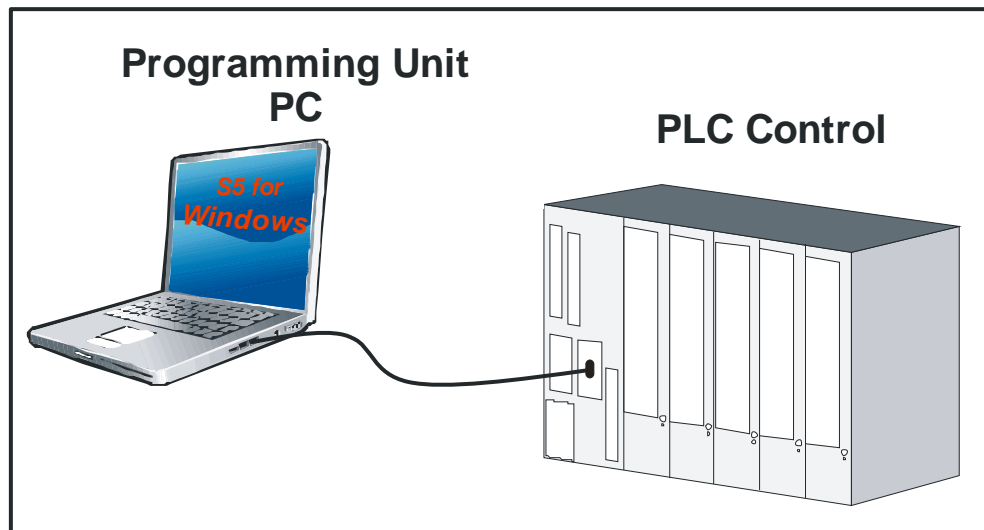
Disconnect from the PLC

The PLC online connection is disabled.

2 S5 for Windows® Online Functions

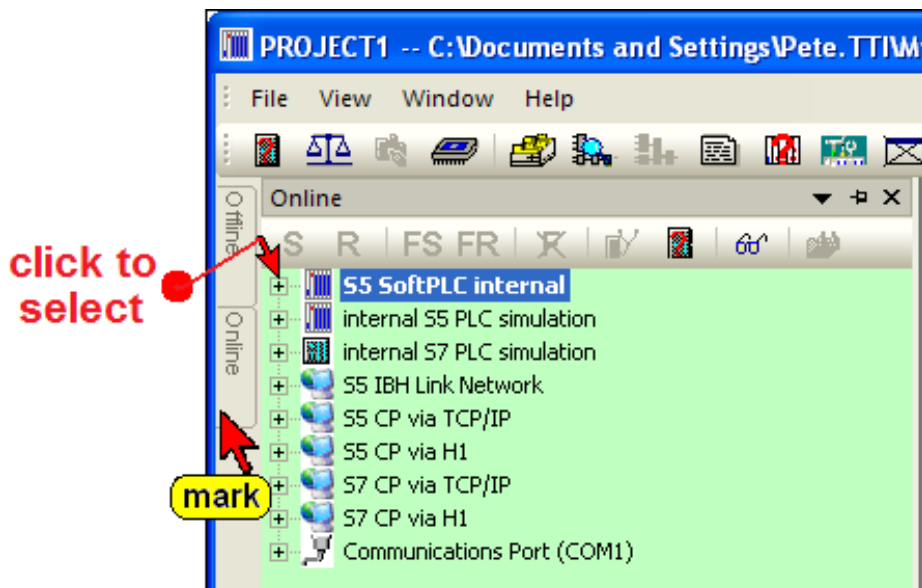
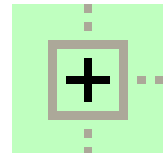
How to troubleshoot an On-Line connection to the PLC

2.1 Connecting the S5 PLC with a PC

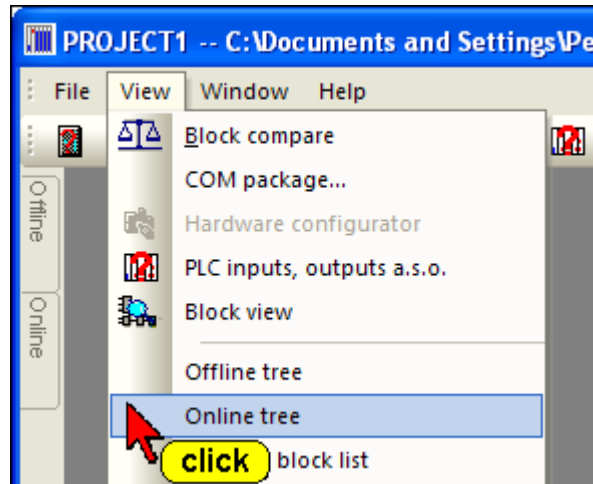


The S5 PLC's connected to the PC are listed in the “**Online – Tree**”.

All possible connections are listed. To select a connection click the icon in front of the name. The established connection is displayed in bold letters.



If the “**Online**” tab is not shown, use the command “Online tree” from the “File” menu.



It is recommended that you use the “Auto Hide” icon to lock the tab at the outside border of *S5 for Windows*®. By moving the mouse pointer to the tab, the window will automatically open.

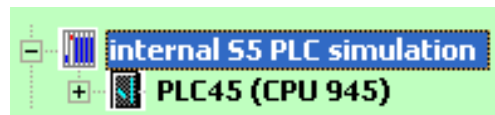


S5 SoftPLC internal



On the PC executing *S5 for Windows*®, an S5 SoftPLC can be installed (optional). This software PLC could be used to control machinery. Inputs and outputs are handled via a bus system (Profi Bus etc.)

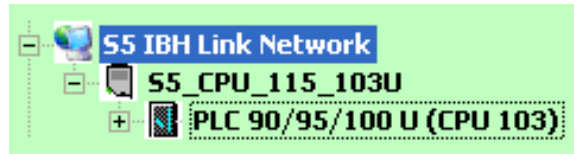
Internal S5 PLC Simulation



S5 for Windows® provides an internal simulation PLC. With the integrated simulation PLC you can test PLC programs. For testing you do not need additional hardware. The programs are tested directly within your PC. The status is displayed, you can force inputs, and you can display the outputs.

The internal simulation PLC is fully compatible with the S5 CPU 945.

S5 IBH Link Network



The **IBHLink S5** is an Ethernet-converter within a 15-pin Sub-D-housing for a connection via a switch, a hub or even directly to a PC with a common network adaptor. The protocol used is the standard TCP/IP protocol. In this way, the user can benefit from all the advantages of Ethernet, such as remote maintenance via a standard router or VPN-connections (Virtual Private Network). Likewise, a direct connection to the Internet is possible.

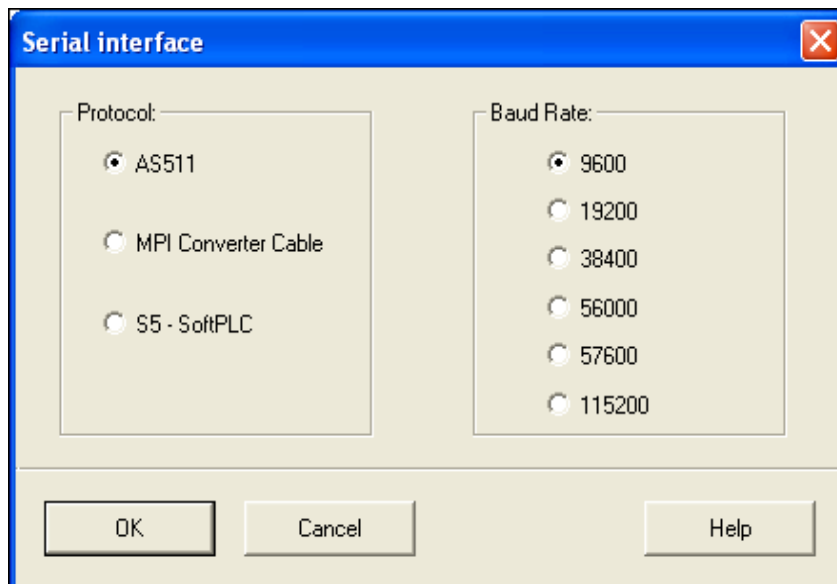
S5 CP via TCP/IP; S5 CP via H1

These connections require “Communication Processor Boards” in the PLC. The connections are listed because a standard Ethernet connection is required at the PC side.

Communication Port (COM1)



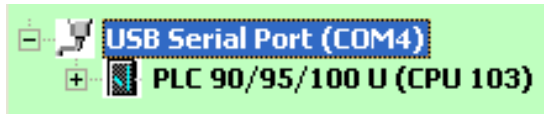
Selecting the Communications serial ports (COM 1 – COM 4) will open a dialog box to select the Baud Rate and the Protocol.



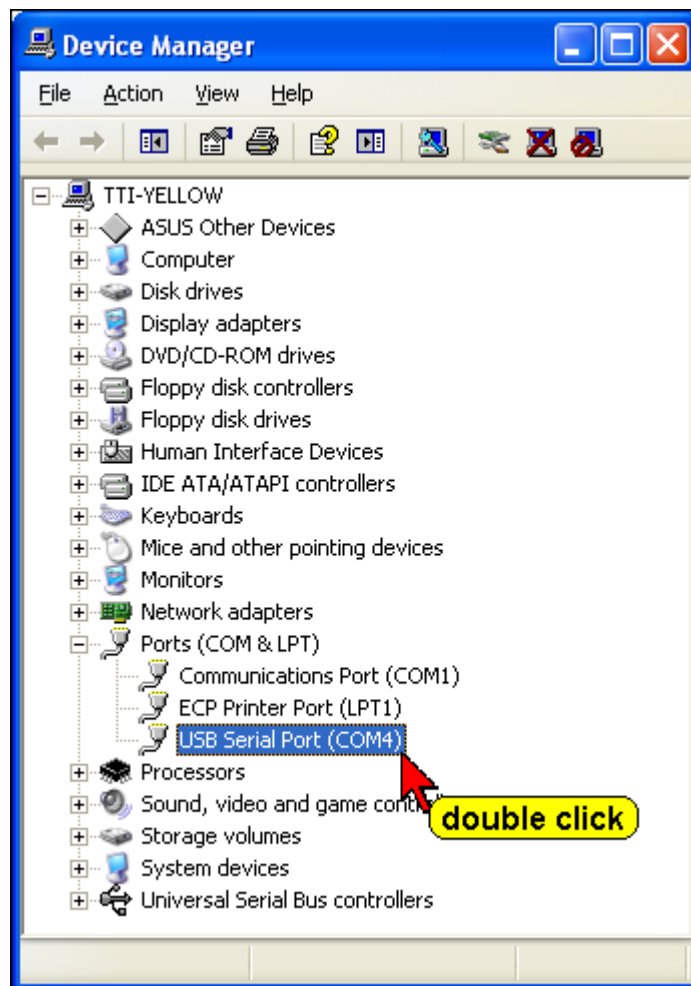
The Simatic S5 PLC must be connected to one of the serial ports (COM 1 – COM 4) of your PC via a 20mA current loop converter. Select the AS511 (Simatic-S5) protocol for the communication.

The Simatic S5 can only handle a Baud Rate of 9600 Baud. *S5 for Windows®* allows you to select higher baud rates for the communication with other compatible PLC's.

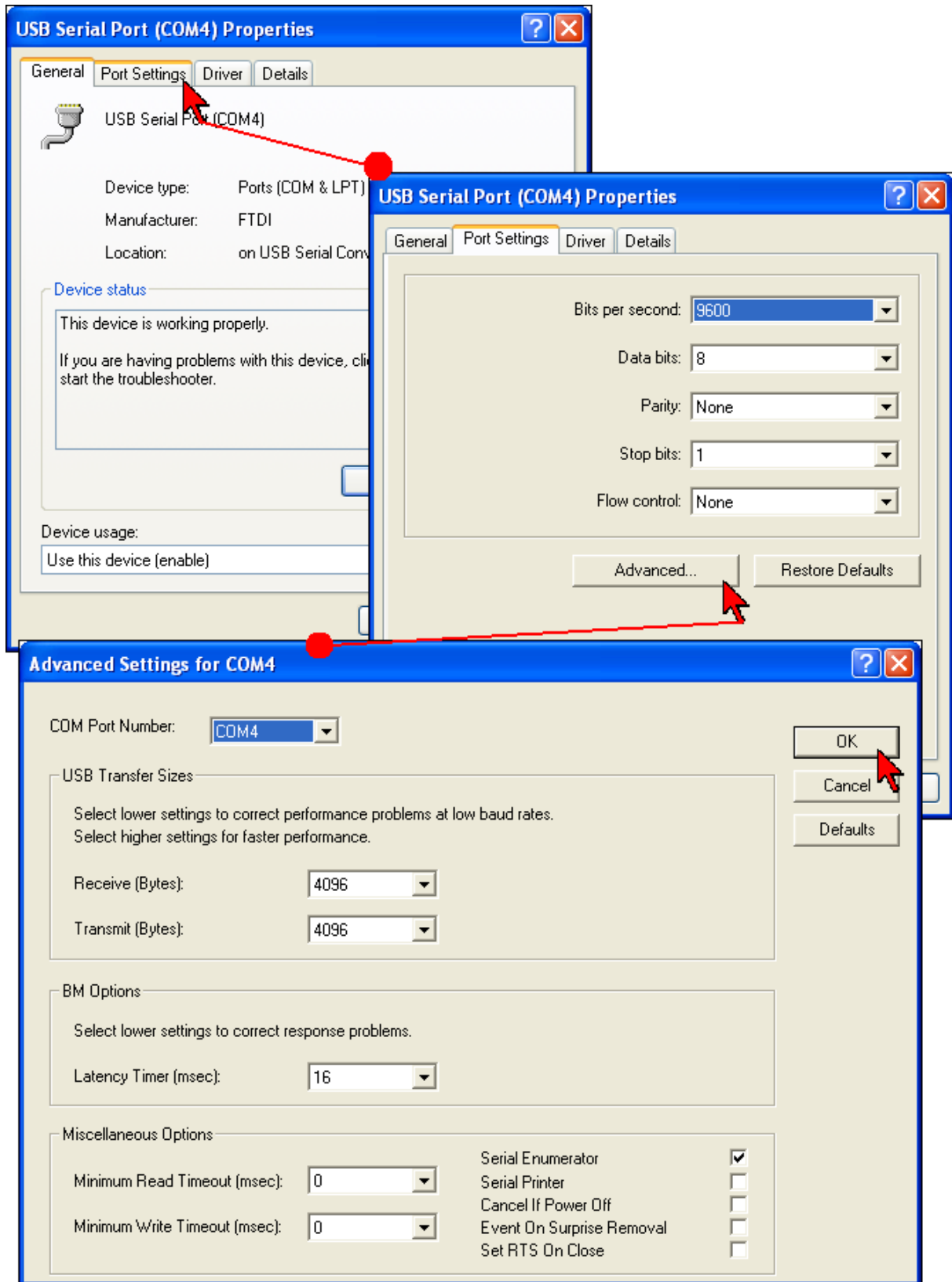
USB Serial Port (COM3)



S5 for Windows® cannot handle an USB Port connection directly. To use an USB connector cable, software must be installed to convert the COM port connection to an USB port. This software driver is provided with the USB cable. The following pictures show the correct settings of the USB Serial Port conversion. Double click "USB Serial Port (COM3)" to open the dialog to set the port parameters.



Device Manager Settings (USB – COM conversion)



2.2 Transferring all PLC Blocks of a STEP® 5 / S5W Project to the PLC

The PLC Blocks of a STEP® 5 / S5W Project can be directly transferred to the connected PLC. No conversion is necessary.

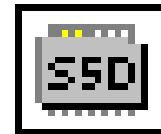
Note:

If your PLC projects (programs) have been created with one of the following SIEMENS programming units (PU), PG-685, PG-675 or PG-635 in CPM, they must be converted to a DOS disk format.

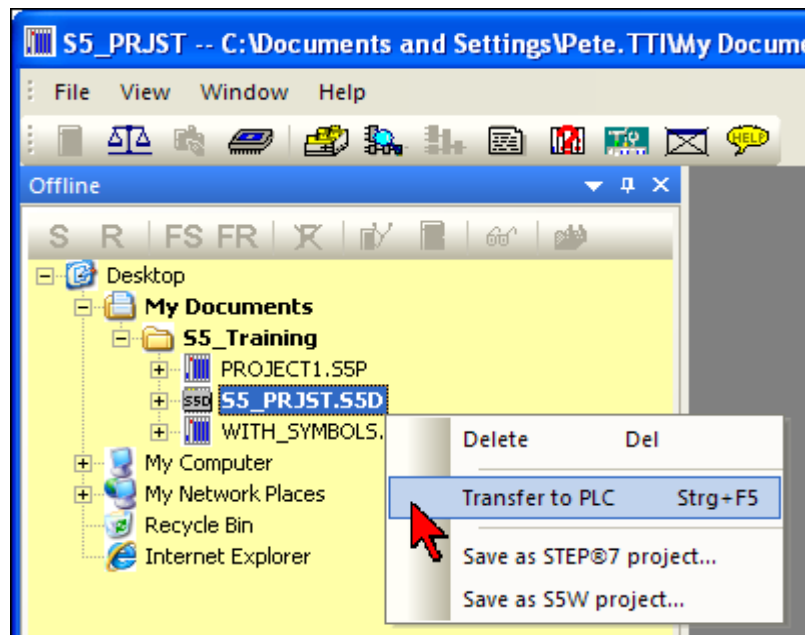
The converted projects may be used directly by *S5 for Windows®*. No conversion is necessary but recommended.

Transferring a STEP® 5 Project to the PLC

The following icon identifies a STEP® 5 Project. PLC projects (programs) created with the basic PLC programming package STEP® 5 from SIEMENS with a DOS operating system (or S5-DOS) may directly be transferred to the PLC.



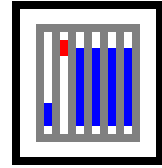
Open the “Offline – Tree” and click the project name with the right mouse button. Click “Transfer to PLC” in the context menu.



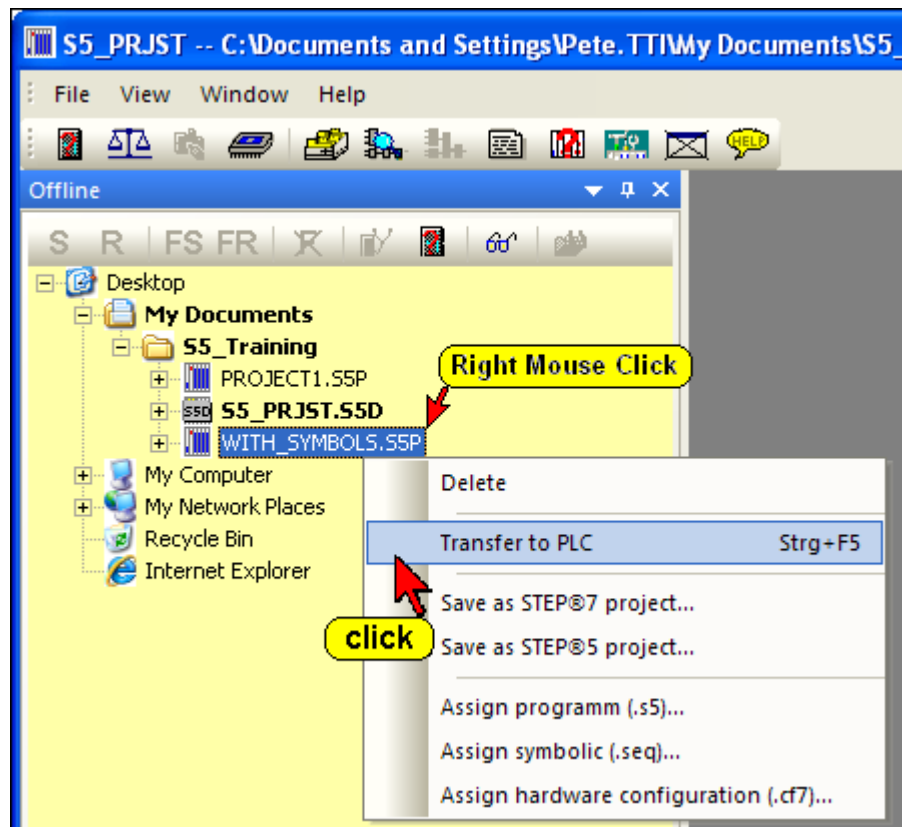
The PLC project, with all the PLC Blocks, is transferred to the connected PLC.

Transferring a S5W Project to the PLC

The following icon identifies a S5W Project.

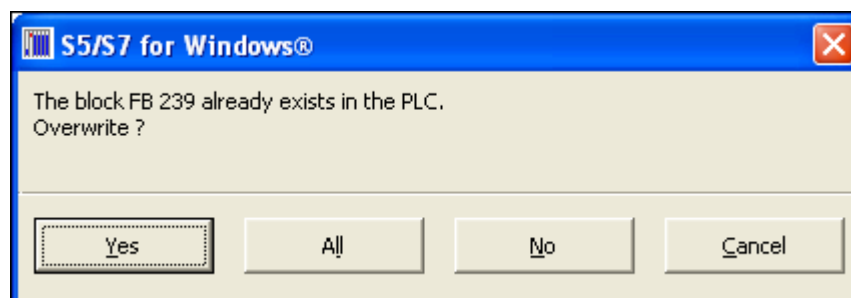


Open the “Offline – Tree” and click the project name with the right mouse button. Click “Transfer to PLC” in the context menu.



The PLC project, with all the PLC Blocks, is transferred to the connected PLC.

If a block is currently stored in the PLC, a dialog box will open to allow you to overwrite the block or to abort the transfer.



Activating the **Yes** button will only overwrite the PLC block mentioned in the dialog box. If another block is stored in the PLC, the dialog box will be opened again.

2.3 Transferring a PLC Program or PLC Blocks to the PC

To transfer Blocks from the PLC to the PC, an S5 project must be available in the PC to store the transferred Blocks. The project must be selected prior transferring Blocks to the PC.

A single Block, several Blocks or all Blocks can be transferred via the serial link to the PC. The selected (marked) blocks in the PLC block list are transferred to the PC. This can be a single block or multiple blocks.

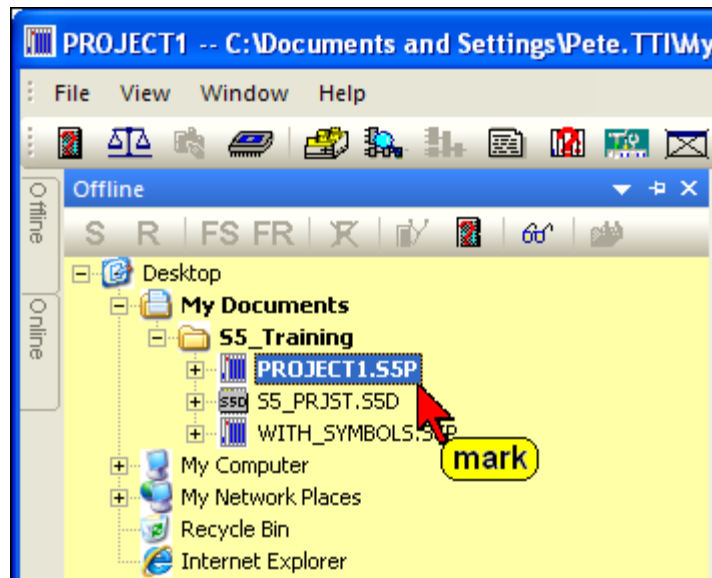
Warning:

You should only transfer blocks from the PLC to the PC if the selected blocks do not exist in the PC Block List.

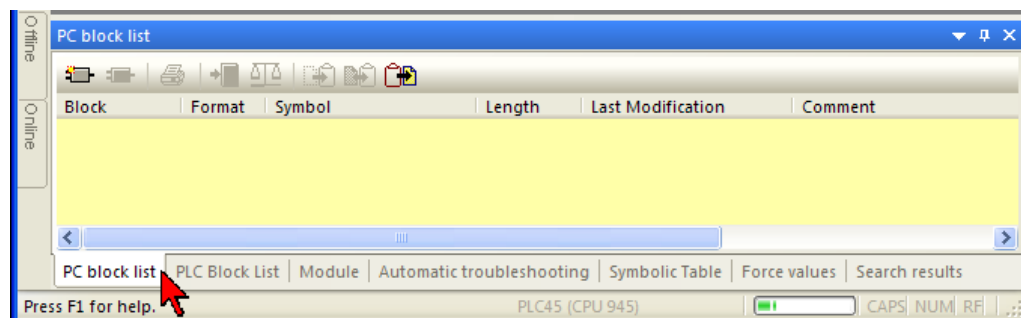


If a block in the PC is overwritten by a PLC block, it is possible that comments will be shifted. Jumps may not be valid anymore and jump labels may be exchanged with substitute labels (M001 etc.) and shifted.

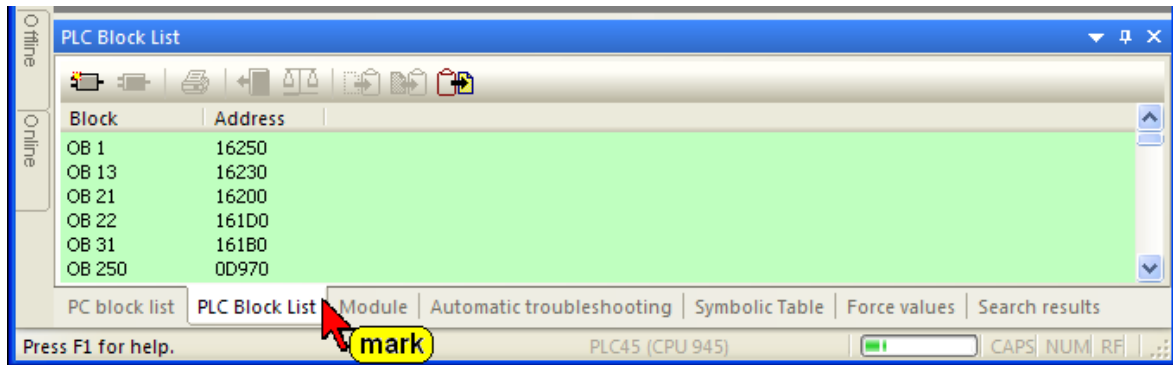
Select the Project to save the PLC Program



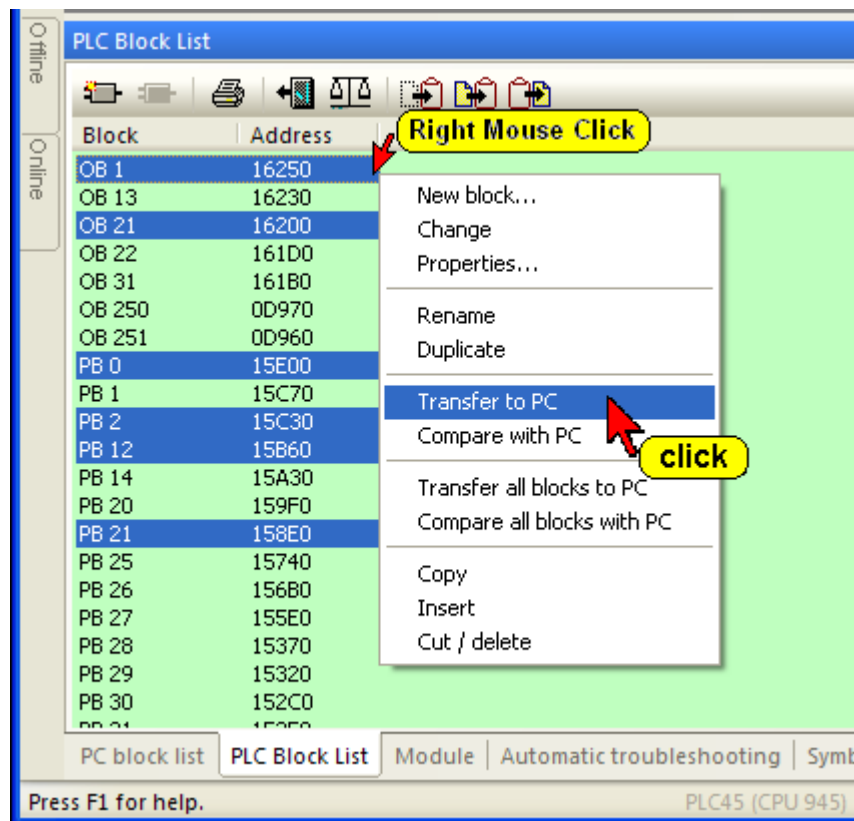
Make sure the PC Block List is empty.



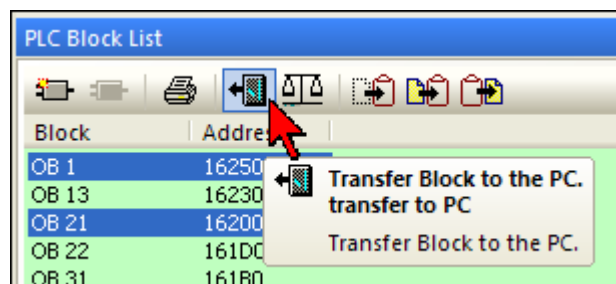
Open the PLC Block List



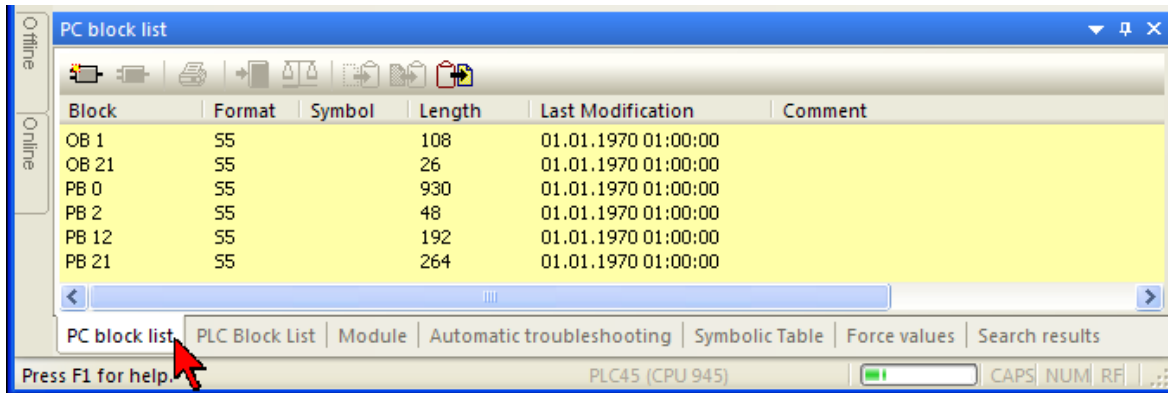
If you want to transfer one or several blocks to the PC, mark these blocks in the PLC Block List and click on one of the marked Blocks with the right mouse button. Click “Transfer to PC”.



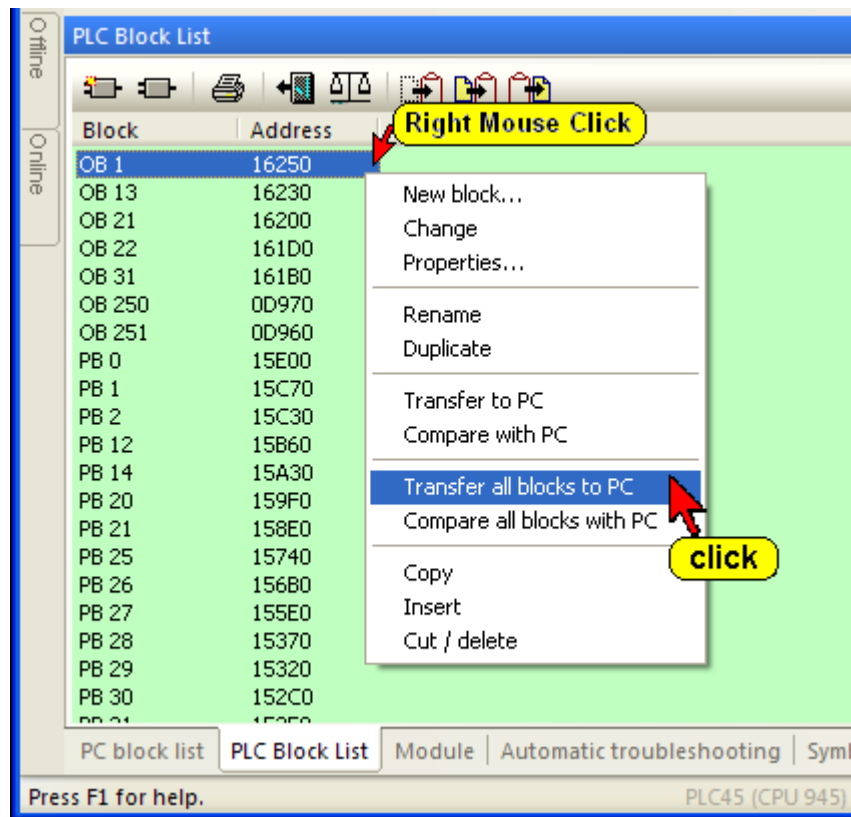
Instead of using the right mouse button and the command “Transfer to PC” you may use the “Transfer to PC” icon.



The marked Blocks are transferred to the PC and are listed in the “PC Block List”.



To transfer all PLC Blocks from the PLC to the PC, use the command “Transfer all blocks to PC”. Click on one of the marked Blocks with the right mouse button. Click “Transfer all blocks to PC”.



All Blocks from the PLC are transferred to the PC and are listed in the “PC Block List”.

3 S5 for Windows® Tools to Debug a S5 PLC Program

Most tools to debug a S5 PLC Program can only be used if the PLC Program is present in the online PLC, **and** also saved in a S5 Project on the PC.

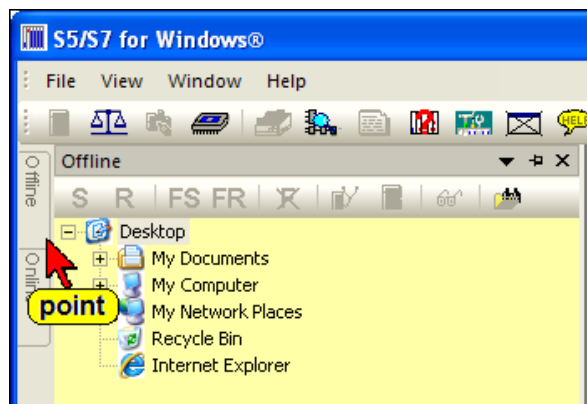
ATTENTION:

If you don't have the original PLC program with symbols and comments we recommend that you download the PLC program to the PC as described in chapter 2.

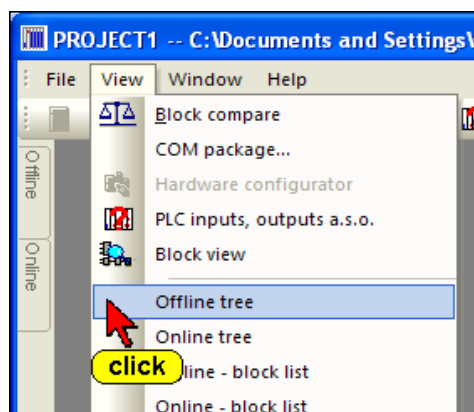


3.1 Opening a S5 PLC Program saved in a “S5 Project”

Open the “Offline – Tree” by pointing at the “Offline” tab.



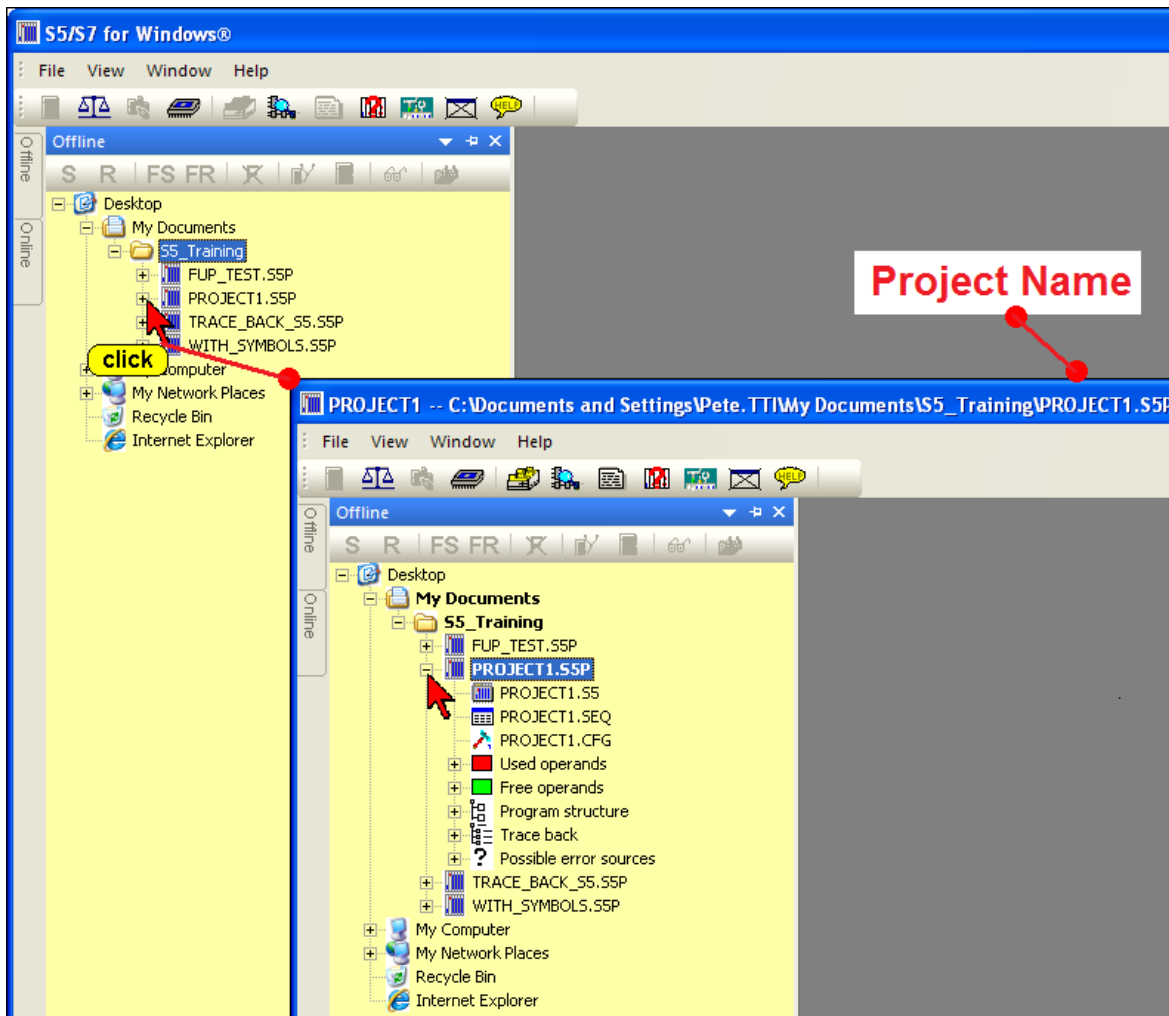
If the “Offline” tab is not shown, use the command “Offline tree” from the “File” menu.



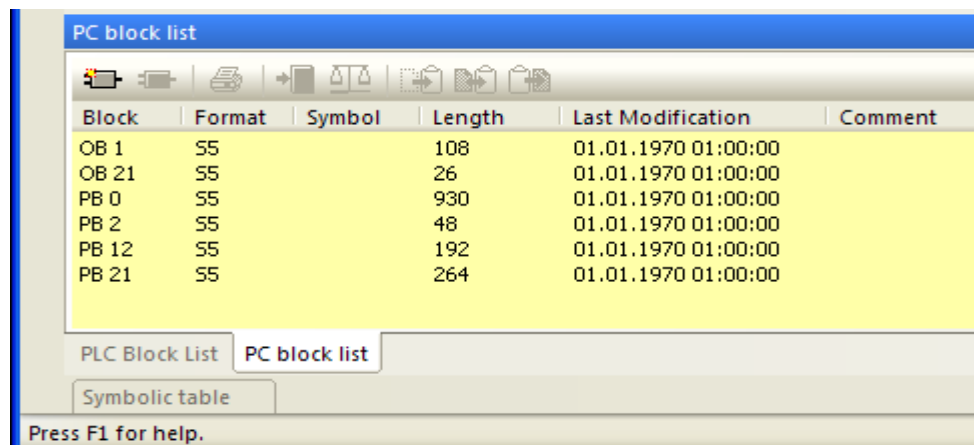
In the “Offline” window select the path and click on the icon in front of the project name (PROJECT1.S5P).



The project files and other tools are shown.



The project name, with its path is shown. Also the Blocks are listed in the “PC Block List”.



The PLC Program is now open for further use.

3.2 Comparing the existing Online and Offline PLC Program

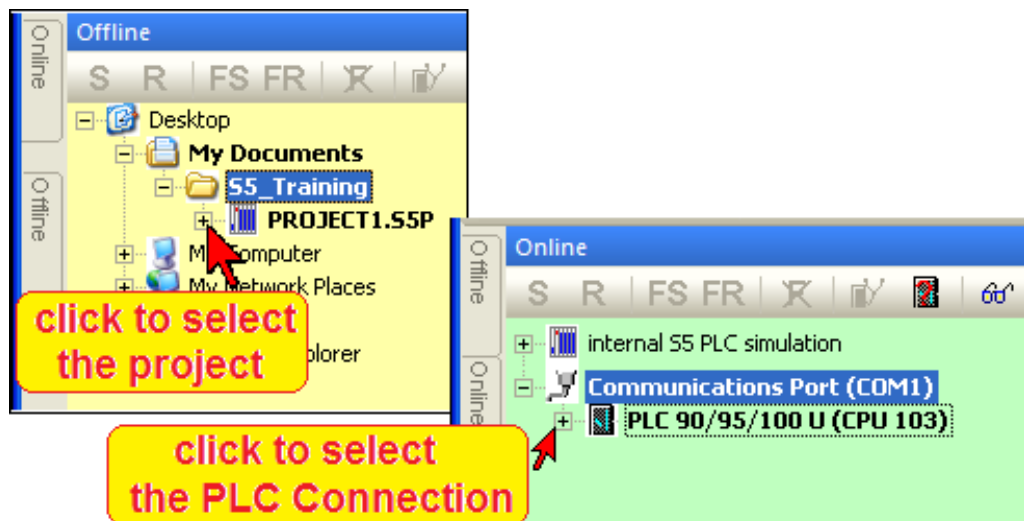
ATTENTION:

If you are using the original PLC program with symbols and comments make sure that the program executed at the PLC is identical with the original PLC program you have on the PC.

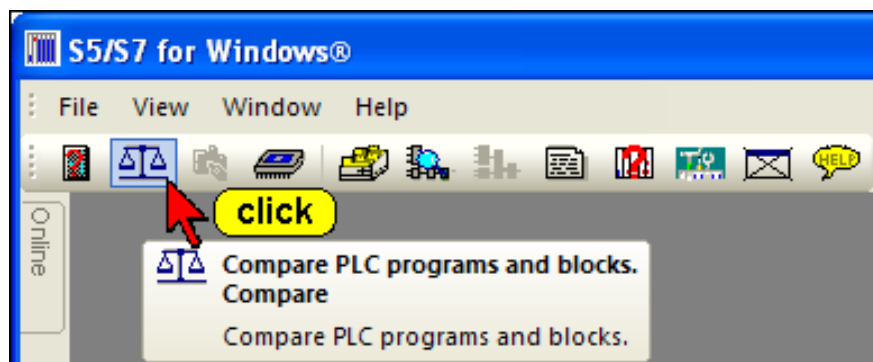


Use the “Compare Tool” to verify that the Program on the PC has the same code as the PLC program executed at the PLC.

Select the required PLC at the “Offline – Tree” and the PLC to be connected to from the “Online – Tree” (see chapter 1).

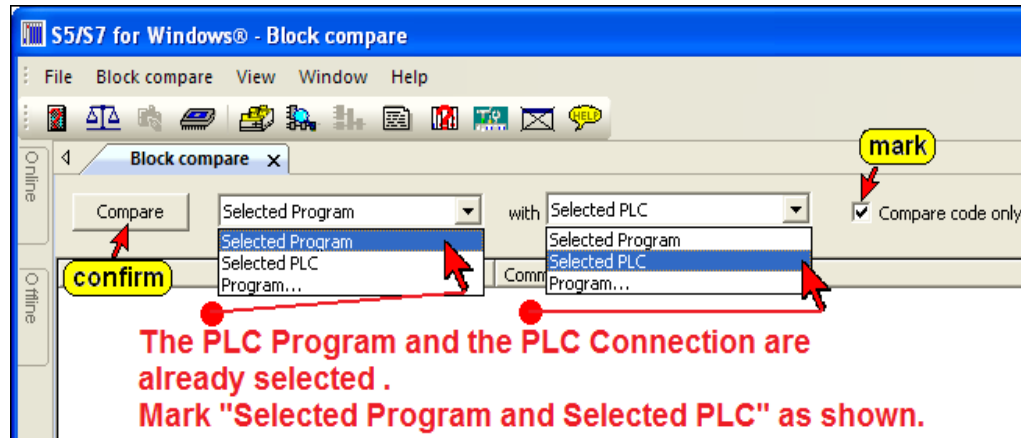


Compare Tool

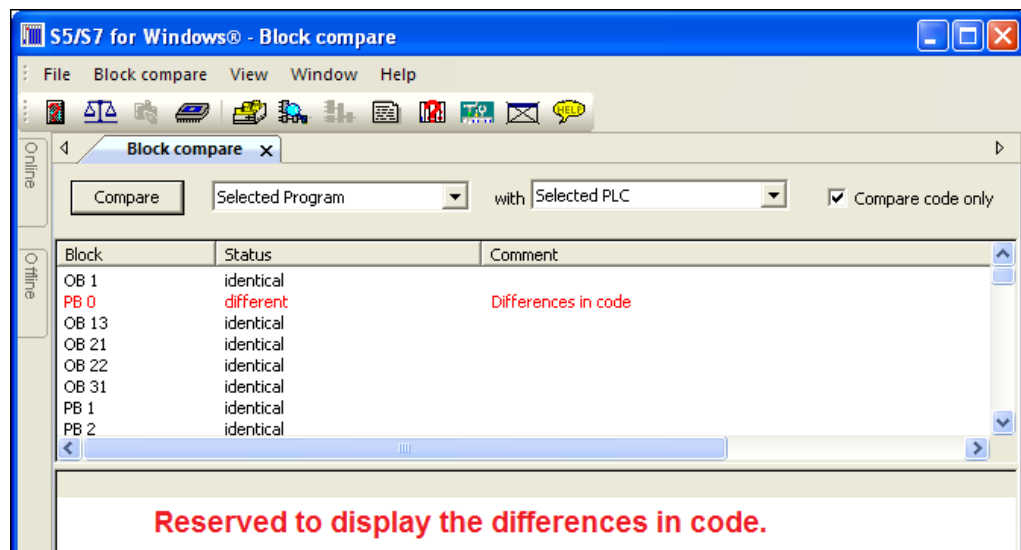


Click the icon to open the Compare window.

You may select the two locations where the files to be compared are located.



When comparing a PLC Program on the PC with the Program executed on the PLC, only the code is relevant. Mark "Compare code only". To start the comparison confirm by clicking the "Compare" button.



The compare result is shown in the upper part of the compare window. PLC Block names written in black are identical, PLC Block names shown in red have differences in the code.

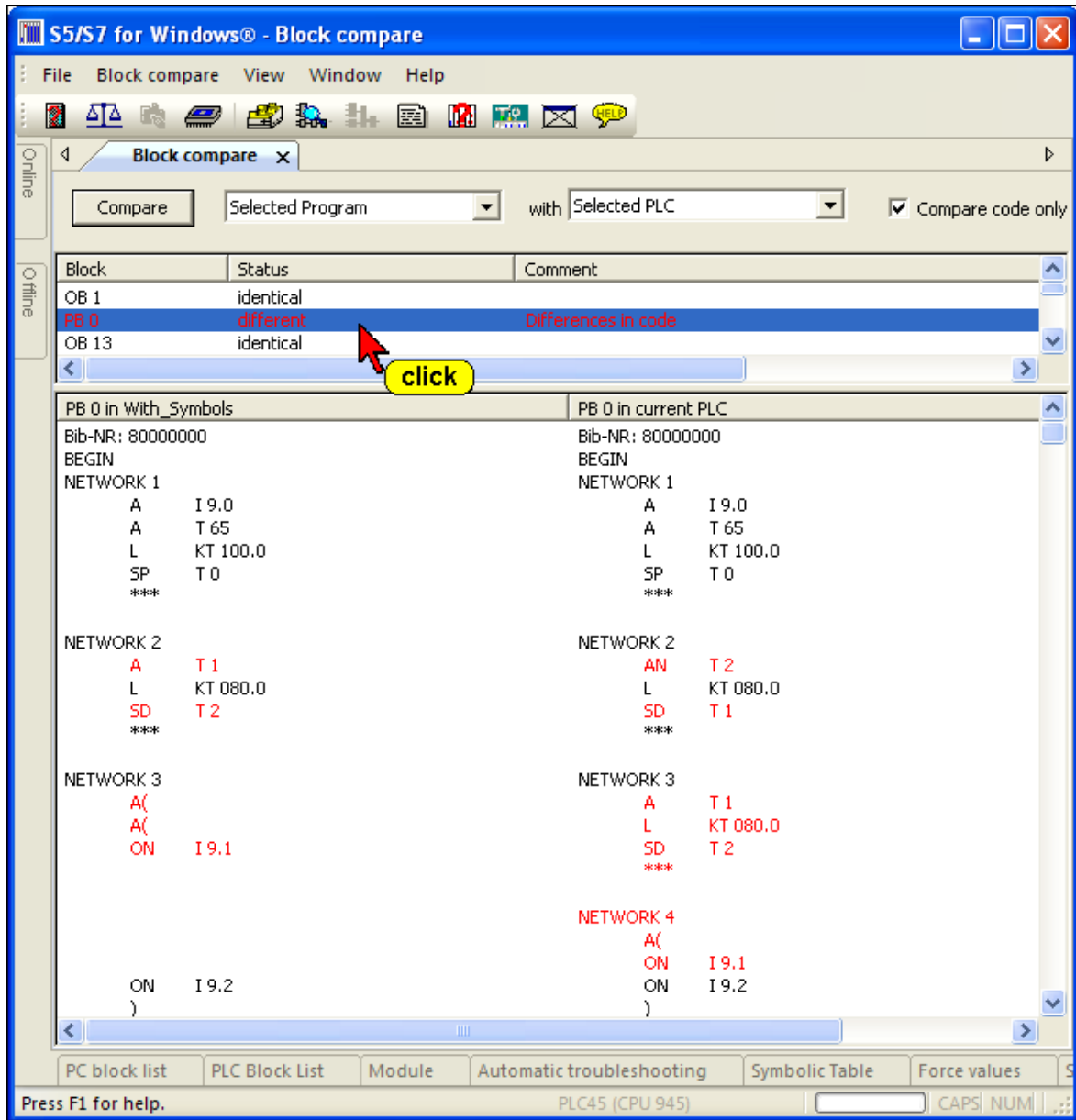
ATTENTION:

Do not transfer blocks from the PLC to the PC if the selected blocks exist in the PC RAM.

If a block in the PC is overwritten by a PLC block, it is possible that comments will be shifted and labels may not be valid anymore (labels are exchanged with substitute labels (M001 etc.).



Differences in Code



Clicking the Block name opens a window with the details of the compared Blocks. Any differences are displayed in red.

ATTENTION:

Comparing a PLC Program on the PC with the Program executed on the PLC will show (most of the time) differences in Data Blocks (DBxx). This is normal if the data stored in the Data Block is collected from the PLC.

In any event the length of the Data Blocks must be identical.



3.3 Arranging Window in the Workplace

Version 6.x of *S5 for Windows*® has a new concept to open and close windows in the workplace.

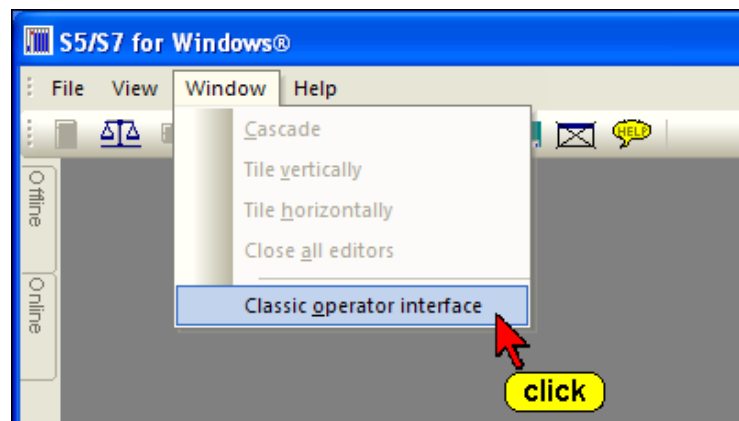
You can use the “Auto Hide” icon to lock the tab at the outside border of the workplace and by moving the mouse pointer to the tab the window will open automatically.

It is also possible to open the “PC Block List” in the workplace and start the “Debug Tools” from there. The “PC Block List” window stays open until you close “PC Block List” the window.

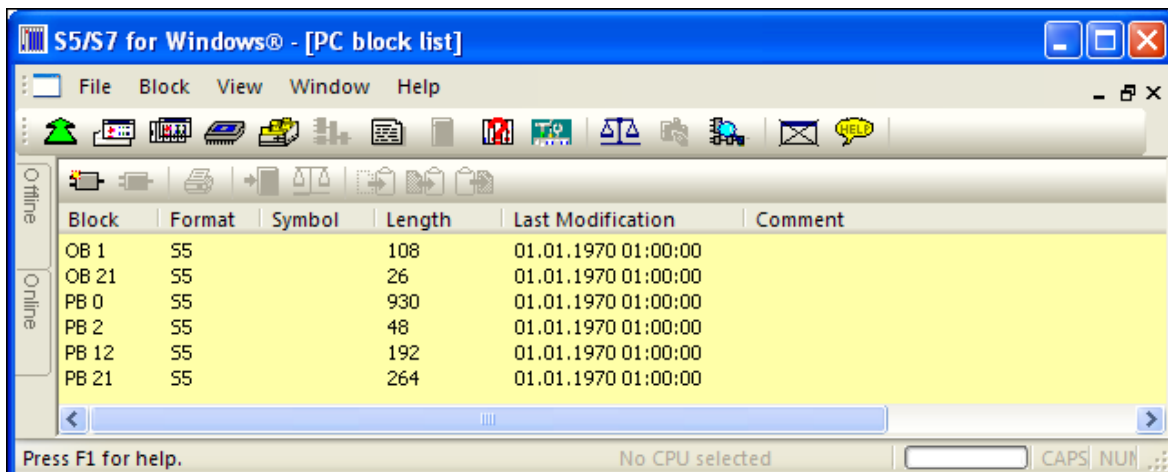
This mode is preferable if you want to change between Blocks being displayed online and offline for modifications.

To work in this “Classic Operator Interface” mode the S5 PLC Program must be opened (see chapter 3.1).

To select the previously described mode, click “Classic operator interface” in the “Window” menu.

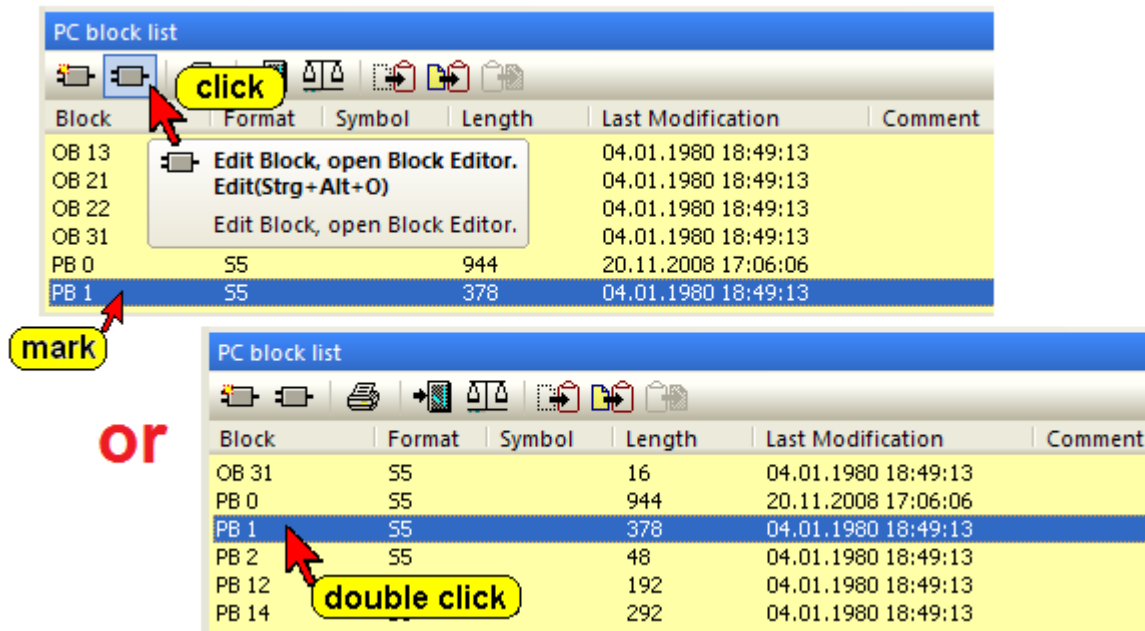


PC Block List in “Classic Operator Interface” mode



3.4 PLC Block Status display

To display the PLC status you must open the desired PLC Block with the “Editor”. You may open the Editor by double clicking the Block name or by marking the Block name and clicking the icon.



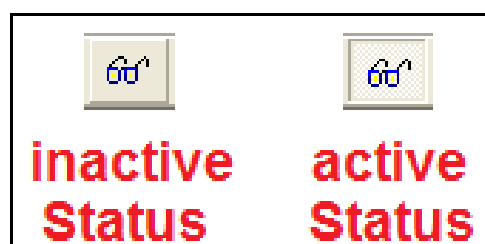
The Block may be selected from the “PC Block List” or the “PLC Block List”. If you use the “PC Block List” existing symbolic comments may be displayed within the status display.

Note:

We recommend that you select the Block from the “**PC Block List**”. If any modifications are made they are saved in the PC and therefore are available the next time the Block is opened.

Activating the Status

An icon is provided to activate the status. Clicking the icon again will deactivate the status.

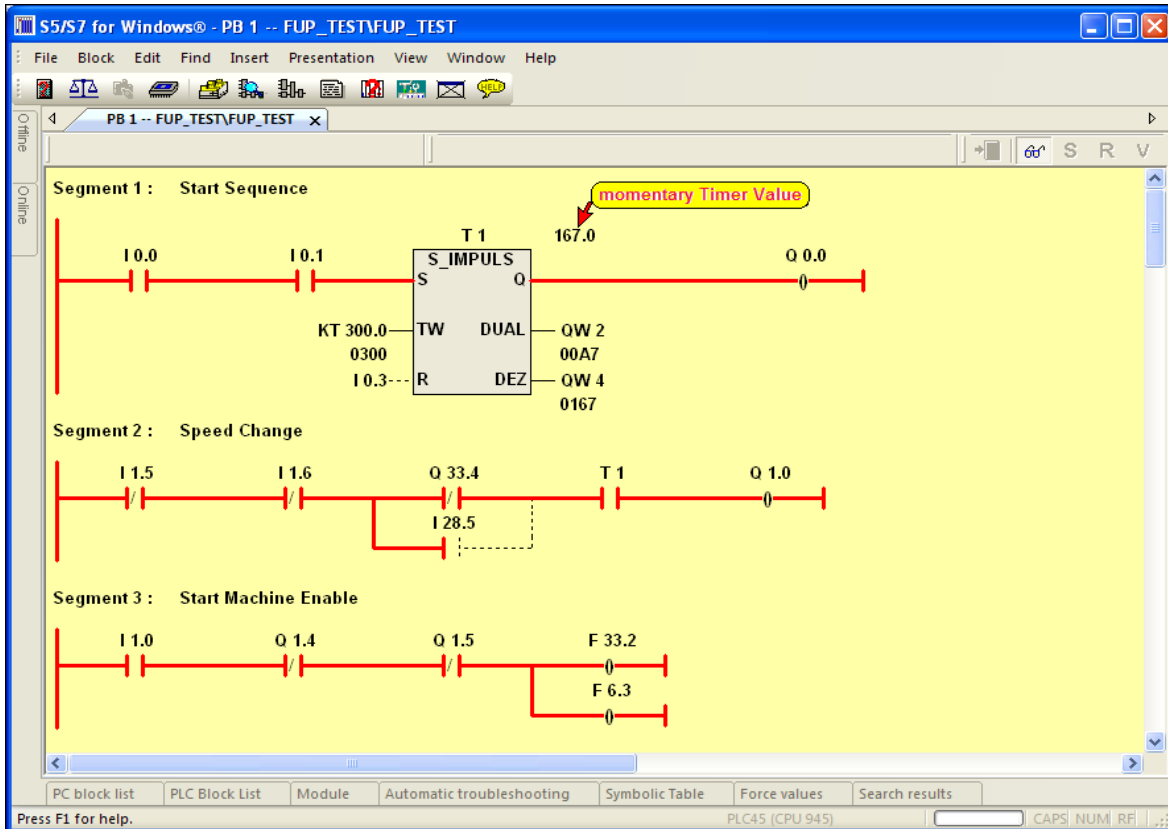


Status Display, Statement List (STL) Presentation

The screenshot displays the STL (Statement List) for three segments in the S5/S7 for Windows software. The interface includes a menu bar (File, Block, Edit, Find, Insert, Presentation, View, Window, Help) and a toolbar. The main window shows the following data:

label	Instruction	Operand	Comment	Address	RLO	Contents	Accu1	Accu2	Status
Segment 1 : Start Sequence									
A	I 0.0		LINE START PUSH-BUTTON	00005	1	1			10000110
A	I 0.1		SLOW STOP PUSH-BUTTON	00006	1	1			10000110
L	KT 300.0			00007	1		00000300	00000000	10000010
SP	T 1		BLINKER	00009	1	075.0			10000011
A	I 0.3		LUBRICAT.& COOL. PUSH-BUTTON	0000A	0	0			10000000
R	T 1		BLINKER	0000B	0	075.0			10000001
L	T 1		BLINKER	0000C	0	075.0			10000001
T	OW 2			0000D	0		0000004B	00000300	10000001
LC	T 1		BLINKER	0000E	0	075.0			10000001
T	OW 4			0000F	0		00000075	0000004B	10000001
A	T 1		BLINKER	00010	1	075.0			10000110
=	Q 0.0		LINE RUNNING LAMP	00011	1	1			10000111
---				00012	1				10000011
Segment 2 : Speed Change									
AN	I 1.5		RVc CHANGE SPEED THRESHOLD FROM SIU	00013	1	0			10000010
AN	I 1.6		RV0 CAPSTAN ZERO SPEED FROM SIU	00014	1	0			10000010
A(00015	1				10000011
ON	Q 33.4		1-SPOOLER DRIVE ENABLE	00016	1	0			10000010
O	I 28.5		1-FORKS TEST	00017	1	0			10000010
)				00018	1				10000110
A	T 1		BLINKER	00019	1	075.0			10000110
=	Q 1.0		ENGAGEMENT FRICTION AXLE 78	0001A	1	1			10000111
---				0001B	1				10000011
Segment 3 : Start Machine Enable									
A	I 1.0		START MACHINE ENABLE	0001C	1	1			10000110

Status Display, Ladder Logic (LAD) Presentation



Status Display, Ladder Logic (LAD) Presentation with Symbolic Table

Symbol	Operand	Comment
I 9.2	I 9.2	OK FROM CAPSTAN DRIVE
I 9.3	I 9.3	RVx AUX.SPEED THRESHOLD FROM SIU
I 9.4	I 9.4	RVmax MAX.SPEED THRESHOLD FROM SIU
I 9.5	I 9.5	RVc CHANGE SPEED THRESHOLD FROM SIU

Status Display, Control System Flowchart (CSF) Presentation

Symbol	Operand	Comment
F 51.0	F 51.0	W.D.M./CAPSTAN START REQUEST SUM
F 51.3	F 51.3	REFERENCE ENABLE
F 51.5	F 51.5	W.D.M. DRIVE CONTROL (ENABLE)

