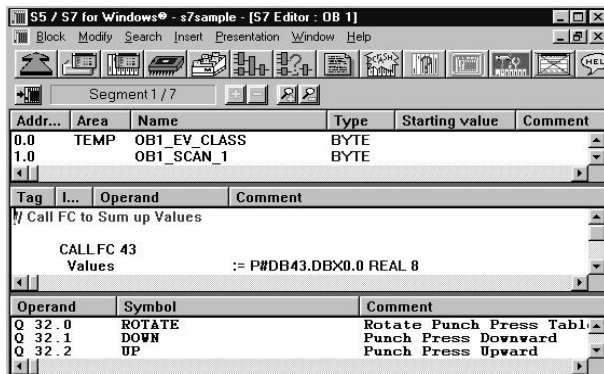


S7 for Windows[®] S7-300/400[®]

A Programming System for the Siemens S7 300 / 400[®] PLC's

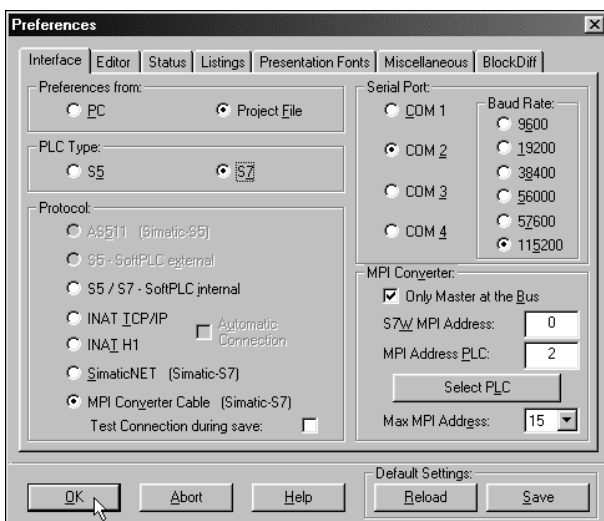
IBHsoftec has an efficient and straight-forward programming system for the Simatic[®] S7-300[®] and



S7-400[®] PLC's. IBHsoftec now offers *S7 for Windows*[®] as an upgrade to the *S5 for Windows*[®] programming system or as a complete stand alone programming package. In the Statement List (STL) the complete instruction sets of the S7-300[®] and S7-400[®] PLC are implemented in the *S7 for Windows*[®] programming package. It is also possible to use the Ladder Logic (LAD) or the Control System Flowchart (CSF) to program and display the Status of the networks. Of course all the online functions are integrated.

Combined Software Package *S5 for Windows*[®] and *S7 for Windows*[®]

Your investment in intellectual property and your programmer's experience with S5 PLC's can be converted and transferred directly to the S7-300[®] and S7-400[®] PLC's. A smooth transition to a mod-



ern controller concept can be obtained by extending the capabilities of the popular *S5 for Windows*[®] Programming system. As a result, *S5 for Windows*[®], which operates with the Step[®]5 pro-

gramming language, continues to be used as the basic programming system. With this concept it is now possible to have a common editor that understands both Step[®]5 and Step[®]7 syntax. This allows you to easily convert Step[®]5 code into Step[®]7 code and vice versa. Using this capability you can open S5 blocks with the S7 editor, even if all of the instructions cannot be directly converted (instructions not converted are marked in the block and allow you to manually edit those instructions).

Short Familiarization Period

Our implementation of *S7 for Windows*[®] provides the programmer with the ability to take advantage of the benefits of using new hardware without being required to learn a new complicated programming system. For the programmer there is virtually no difference when writing a program for the Simatic[®] S5 or S7 PLC series, when using the Step[®] 5 instruction set. Of course, to use the full Step[®] 7 instruction set it is necessary to know the use of the new instructions. But even when using the full capability of all the new instructions, the look and feel of the programming software is very much the same when programming or testing an S5 or S7 PLC program.

Windows-Platform

The user can select the Windows operation systems he or she prefers to use for programming. The software packages *S5/S7 for Windows*[®] require a 32-Bit Operating System and may be installed on PC's running Windows 98/2000/NT 4.0/XP.

Converting S5 Programs into S7 Programs

S5 programs can be converted into S7 programs. This is done with the conversion command and can be done on a block by block basis. The conversion can be done automatically, without any operator intervention in the background, when the S5 program is downloaded to the S7-300[®] and S7-400[®] PLC. Not all S5 programs can be converted directly and completely into a program that is understood by the S7-300 and S7-400[®] PLC. This is because the internal structure, coding, memory areas, PLC block names and PLC block structure of the S5 and S7 PLC's vary in many ways. To assist the user in converting programs, the PLC block list window can display the S5 name, the S7 name and the format of the code. A block that cannot be completely converted will be marked with an (E) and the length is set to zero (0) so it can't be transferred to the PLC. The blocks marked with an (E) can be opened with the *S7 for Windows*[®] S7 Editor for modifications.

S7 for Windows® s7-300/400®

New PLC Block Names

The programming language for S7-300/400® PLC's does not use Program Blocks (PB), Step Sequence Blocks (SB), extended Function Blocks (FX) or extended Data Blocks (DX) that are understood by the S5 programming language. The S7 programming language uses PLC Block groups Functions (FC), Function Blocks (FB), Data Blocks (DB), System Functions (SFC), System Function Blocks (SFB) and System Data Blocks (SDB). S7 for Windows® uses predefined assignments to convert S5 Block names into S7 Block names. This predefined name conversion list may be modified by the user.

Program Transfer to the S7

Programs generated with S7 for Windows® of course can be transferred to an S7-300/400® PLC. Blocks displayed in the Block List window and marked S5 Format, can be transferred to an S7-300/400® PLC if the S5 Code is directly convertible into S7 code. The automatic conversion takes place during the download. Downloaded PLC programs can be monitored and modified with S7 for Windows®. The S5 code, converted during the download to the S7 CPU can still be monitored in the Status Display as native S5 code.

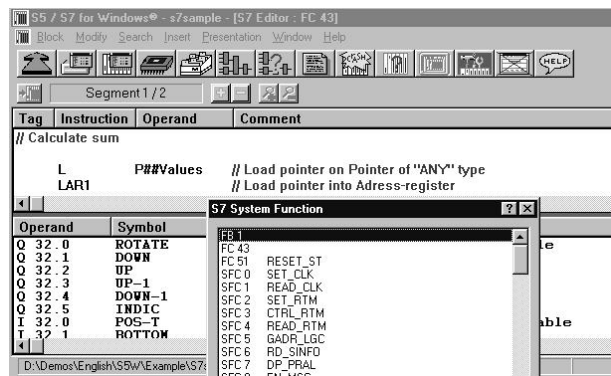
On-Line Functions

S7 for Windows® offers a full range of on-line functions to debug, test, and modify the PLC program transferred to the S7-300/400® PLC series. The status of the PLC can be monitored in the graphical display. Separate windows are available to display the Interrupt Stack (I-Stack), the Block Stack (B-Stack), and the Diagnostic Buffer. If there are several S7-300/400® PLC's connected with S7 for Windows® a dialog box is provided to select the PLC that you want to communicate with. The PLC Block List window can display the S5 name, the S7 name, and the Format of the corresponding Block in the PC Block List. The logic of a Block that has been opened from the PLC Block List window (Status or Editor) will be displayed with its syntax (S5 or S7) indicated in the PC Block List window.

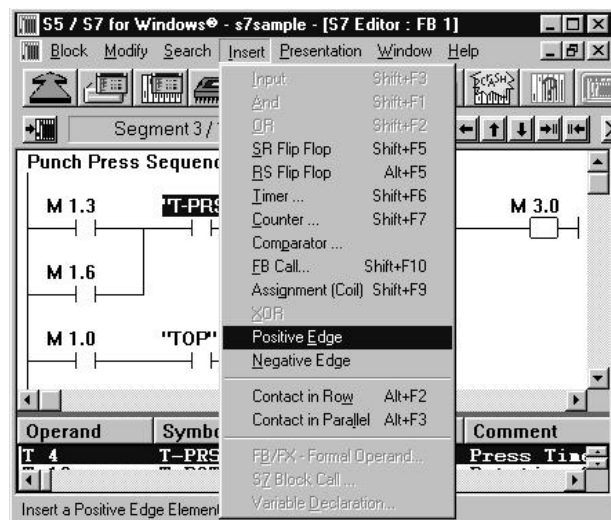
PLC Logic Presentation

As in S5 for Windows®, the user can select the PLC Logic Presentation with S7 for Windows®. Programming, editing and testing of the program in Step® 7 syntax can be done in Ladder Diagram, Statement List, and Control System Flowchart presentation. All presentation formats can be

switched back and forth with a click of the mouse or the keyboard. Your favourite PLC Logic Presentation mode can be established as a default in your system by marking the corresponding button in the "Preference" dialogue box on the "Editor" page. It is always possible to convert a network programmed in Ladder Logic (LAD) into Control System Flowchart (CSF) or Statement List



(STL). In the other direction, the conversion from Statement List (STL) into Ladder Logic (LAD) or Control System Flowchart (CSF) is not always possible due to the complexity and sophistication of Statement List programming. The programming of PLC Logic in Ladder Diagram or Control System

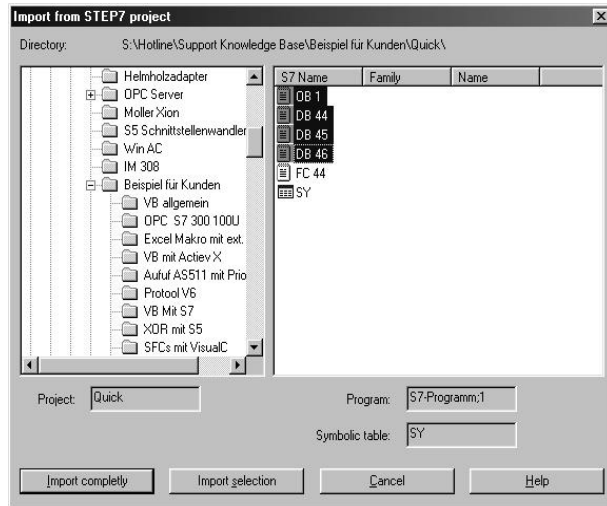


Flowchart presentation is done with the same rules that apply when using Step® 5. The Syntax must follow the rules of the Step® 7 programming language. LAD and CSF presentation use a separate window per PLC Block for the declaration of local variable. To make the declaration of local variables easier, a dialog box where you can define the local variables is implemented.

S7 for Windows® s7-300/400®

Compatibility with Siemens Programming Units (PU).

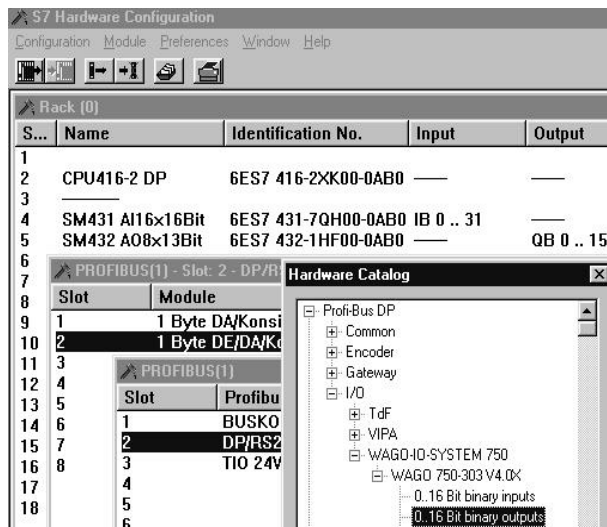
All programs generated on our system, in S7 code, can be comfortably transferred, one to one to the Siemens S7 programming units which can then be handled like any other Siemens generated program. Blocks in *S7 for Windows®*, marked as



S5 Format, must be converted into the S7 format prior to transferring the block to the Siemens PU. All programs written on a Siemens PU and existing Libraries (*.s7p; *.s7l) can be directly imported by *S7 for Windows®*.

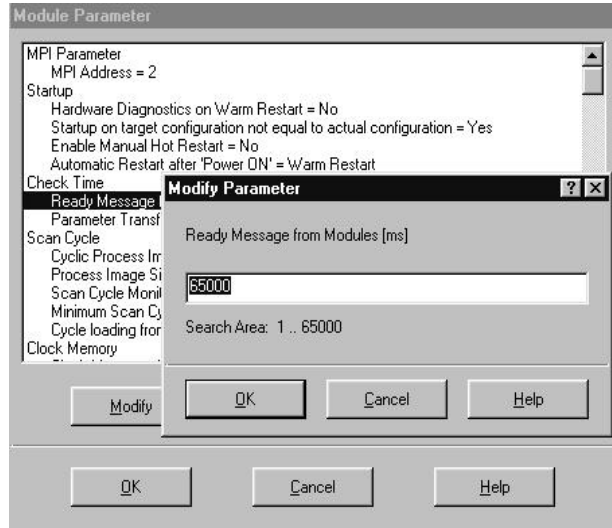
Hardware Configurator

S7 for Windows® provides an integrated tool to set up the Hardware Configuration of the S7-300/400® PLC's, and establish the parameters and ad-



resses of the individual modules. The Configuration Tool is in two parts, the component catalogue and the PLC design window. The Hardware Cata-

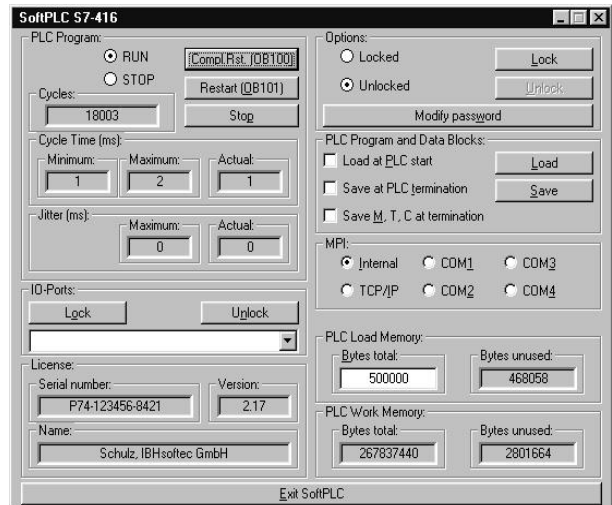
logue is an open system and new components may be added at any time, free of charge from our web site. Each time the Hardware Catalogue is opened the data are recompiled. The Catalogue



contains not only Siemens Profibus components but also Profibus components from other manufacturers. Data files on these components, in the GSD format, can be readily added to the Hardware Catalogue. The PLC design window can import the configuration of an S7-300® and S7-400® PLC and can be modified. Using the PLC design window, offline, you can build your configuration and then transfer the data to the SS7-300/400® PLC.

S7 Simulation PLC

The SimPLC PLC416 is a software simulation PLC

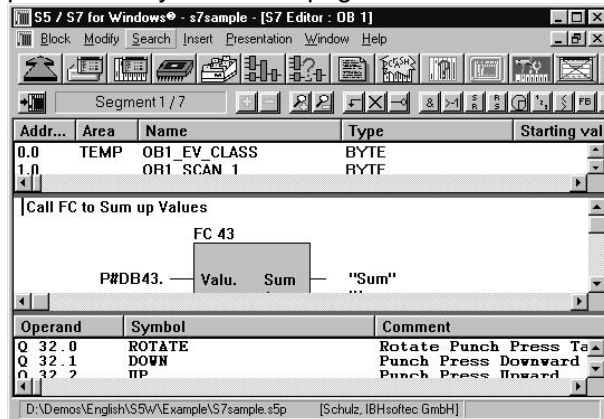


with the functionality and the instruction set of a Simatic® S7 CPU 416.

Online Functions

Program Transfer to the S7 PC MPI

Programs generated with *S7 for Windows*® of course can be transferred to an S7-300® or S7-400® PLC. Therefore you can use the S7 MPI cable which we can offer for the serial and USB port. Details you'll find at page 22.



Blocks displayed in the Block List window and marked S7 Format, can be transferred to an S7-300® or S7-400® PLC. Downloaded PLC programs can be monitored and modified with *S7 for Windows*® (Status Mode).

TCP/IP Protocol

With *S7 for Windows*® it is possible to set up a connection using a TCP/IP protocol to an S7 PLC.

The connection may be accomplished via an Ethernet bus system or via the Internet (Intranet). The PC requires a standard Ethernet Network board and the PLC needs hardware to connect to an Ethernet bus system. The special driver required is already built into the *S7 for Windows*® software. From the dialog box you can select the PLC that you want to go online with. You can select any of the PLC's connected to TCP IP. Another interesting solution is given with the **IBH Link Ethernet/DP/MPI /PPI** gateway (page23)

SimaticNet

If SimaticNet® is installed on the same PC you can use all the online connections which are available / installed within SimaticNet®

H1 (Industrial Ethernet) Bus

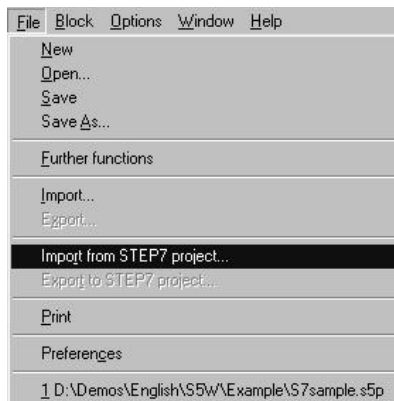
An advanced H1, connection using a standard Ether net network board to connect to the H1 Bus directly, is supported by *S7 for Windows*®. This method requires an additional software driver and a standard Ethernet Network board to connect to the H1 Bus. The PLC requires an H1 communication processor (CPxxx). With the optional driver software installed it is possible to activate the H1 Connection command from the option menu..

S5/S7 Menu Bar Commands



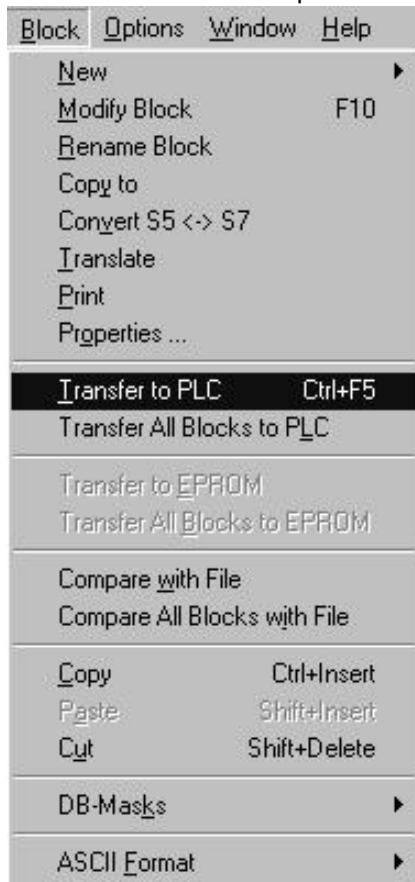
File

The File Menu provides the commands to create, store, open, import or export a PLC program file. Commands for printing and page set up are also available. The “Preferences” dialogue box, where all the *S5 for Windows® and S7 for Windows®* default settings are established, can be opened via the command “Preferences”, from the “File” menu or via the “Preferences” icon from the “Tool Bar”.



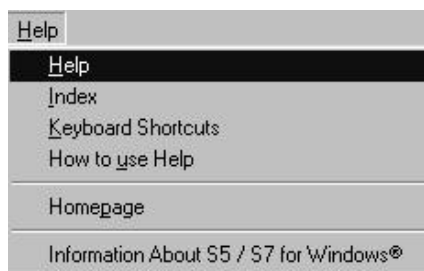
Block

The commands to manipulate Blocks are listed in this menu. The transfer of blocks to the on-line PLC or to an EPROM/EEPROM module is controlled from this menu. Selected blocks (one or multiple) may be copied, inserted or deleted. These commands use a clipboard similar to the function of the Windows Clipboard. Conversion of S5 blocks into S7 blocks and vice versa is done.



Help

S5 for Windows® and S7 for Windows® online Help is an easy way to look up information about the task you are performing, a feature you would like to know more about, or a command you want to use. Help is available whenever you see a help button, or you can use help from the menu bar or the help icon on the tool bar.

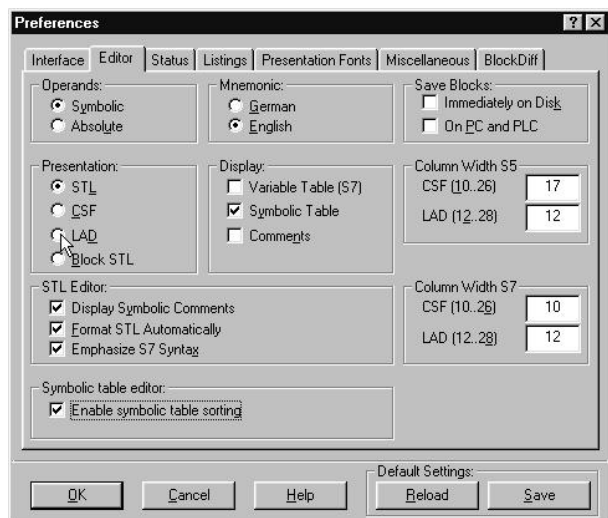


Windows

Eight different windows to manipulate programs are provided. All windows may be opened simultaneously. The Editor and the Status window may be opened several times. It is possible to enlarge or expand the appearance of the logic with a key-stroke. To manage the opened windows, all the windows are listed in the windows menu and the active window is marked. The windows may be arranged automatically by using the cascade and file commands.

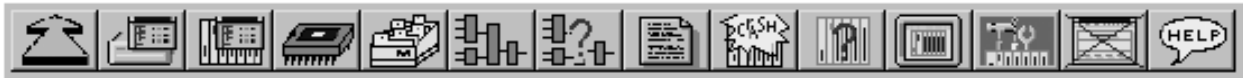
Preferences

The selected configurations are valid for all *S5/S7*



for Windows® windows. The configuration file is saved and will be opened whenever you call a *S5/S7 for Windows®* PLC program. Different fonts and sizes may be selected for printer and CRT display.

S5/S7 Tool Bar Commands



Open next Window



This icon allows for switching rapidly between open windows with a mouse click.

PC (Block List)



This index lists all the Blocks, with the date and time it was created or changed, and a comment. One or more Blocks may be selected for further manipulation.

PLC Block List



This index lists all the Blocks stored in the PLC. One or more Blocks may be selected for further manipulation in the same way it is handled in the Windows File Manager.

EPROM Burner



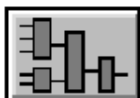
This icon opens a menu to control EPROM burning with the connected EPROMMER. It is only active when the option is purchased.

Cross Reference display



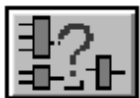
A click on this icon lists the appearance of operands as a symbol or absolute throughout the whole program. This function may be called from any window.

Block Edit



The Block selected in the Block Listing will be displayed in the Block editor and is ready for any changes.

Block Status Display



The status of the signals can be displayed On-Line or from the Internal Software PLC.

Symbolic Library Editor



With this editor you can write, cut, copy and paste text to create and modify the Symbolic Table. The Symbolic Library may be tested for multiple use of addresses or symbols and sorted.

PLC Error Display



This icon enables you to view the program interrupt information stored in the PLC (I-Stack, Extended I-Stack, B-Stack' diagnostic buffer).

On-Line PLC Status



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

Integrated S5 Simulation PLC



This icon selects the Integrated S5 Simulation PLC for testing the PLC program. The Simulation PLC has the instruction set of an S5 CPU 944 without system commands.

Preferences



Adjust the settings for S5/S7 for Windows® programming tool to meet your personal requirements. The settings may be changed anytime and are active as soon as the "Preference" dialog box is closed.

Closing Windows



The S5/S7 for Windows® active window is closed by clicking this icon.

Help Function



An integrated subject related help file with an index and a list of keyboard shortcuts for easy operation is available.