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PR 1750/60
Graphical Development Tool

- Program development tool for X-Family controllers and Combics Pro
- Fully graphical programming that even beginners can use
- High-performance simulation features for testing operation and input|output
- Program code generated automatically
- IEC 61131-3-compliant programming
- Powerful debug system with online debugging and runtime monitoring
- Graphical programming languages: Function Block Diagram (FBD) and Ladder Diagram (LD)
- For implementing system-specific solutions
- Powerful project documentation tools

The PR 1750/60 graphical development tool is a programming system for use with X-Family controllers and Combics Pro terminals. It lets you write customer-specific software, or expand upon the existing software supplied with the weighing applications, for precise adaptation to customer requirements. This opens up the entire range of capabilities in X-Family controllers and Combics Pro terminals.

With the PR 1750, you can use the standard programming languages specified in IEC 61131, or create fully graphical simulations of program sequences.

Moreover, PR 1750/60 features special functions to meet the specific requirements of weighing and batching. These include functions for executing user dialogs, communication functions with a computer, database functions, and specially adapted weighing functions.

One special feature is the fully graphical operation of the development tool, created specifically for the PR 1750. The graphical options exceed the usual range of conventional programming tools, so that even beginners can create programs quickly and easily.

The new full graphical capability of the PR 1750 provides absolute clarity in viewing both the program and its component parts and sequences. Working with the graphical tool is easy, even for users who have no knowledge of programming languages or special syntaxes. After all, a visual display "says" much more than any amount of programming text can communicate. Learning and operation of the program are intuitive. This makes the world of programming accessible even to first-time users.

What's more, the built-in simulation feature can show programmed operating and control sequences directly on a computer screen, so that software which is still in the testing phase does not have to be loaded in the controller.

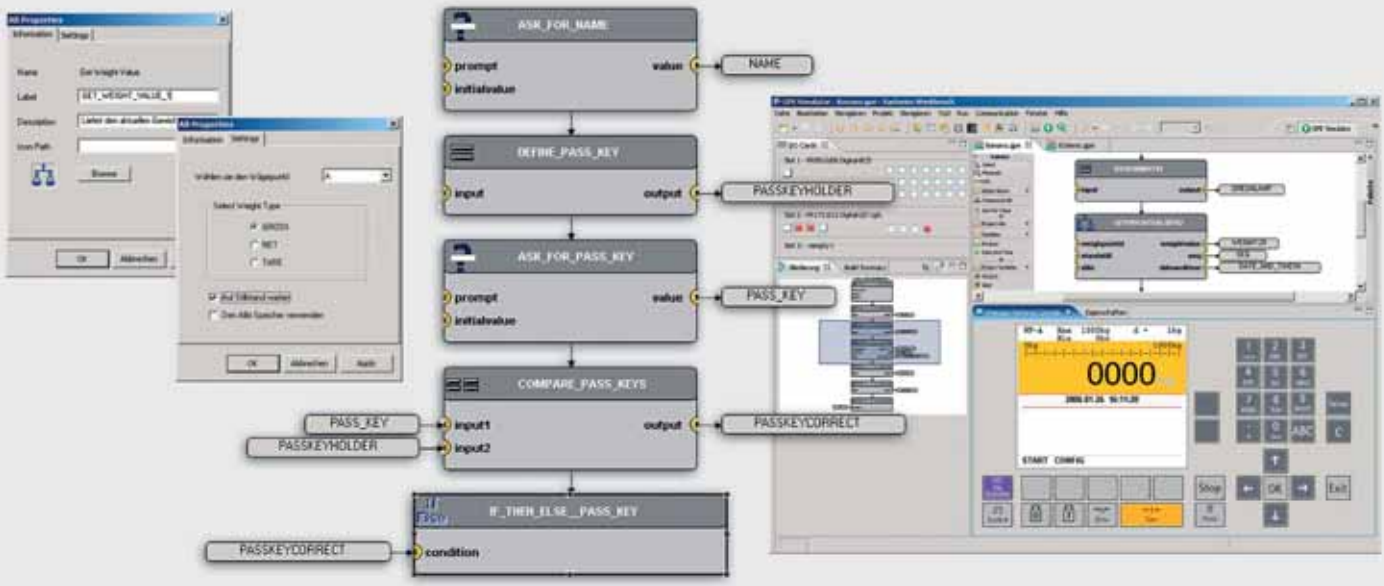
And finally, the graphical environment makes it possible to create program code in IEC 61131 automatically for an entire project.

Consistent use of graphics can save a great deal of time, by shortening the time required for operator training and making projects easier to schedule, thus improving the reliability of commissioning.

The cost of software maintenance is also reduced, since programs can easily be modified and adapted and project documentation is customer specific.

Thanks to greater transparency of the program its sequences are easier to understand, which in turn makes it easier to locate error sources or even prevent errors altogether. The result: a significant improvement in the security and reliability of the entire system.

Fully graphical programming



Fully graphical programming
In the fully graphical environment, program structures and sequences can be created. The default basic structure comes with program blocks for initialization after a cold start, for use with a PLC running in cycles, for implementing configuration functions, for user dialogs and menus, and for the main program.

Program sequences such as IF-THEN-ELSE and loops are shown in "action blocks." Function blocks with parameters that are entered in graphical objects are available; for example, for input and output of values and texts. There are also graphical function blocks for batching, logical I|O links, arithmetic functions, data conversion and printing.

With special function blocks for database processing it is easy to implement tables, such as container, component or price tables. In each case, parameters and attributes are simply entered on dialog pages or similar control elements familiar to all Windows® users.

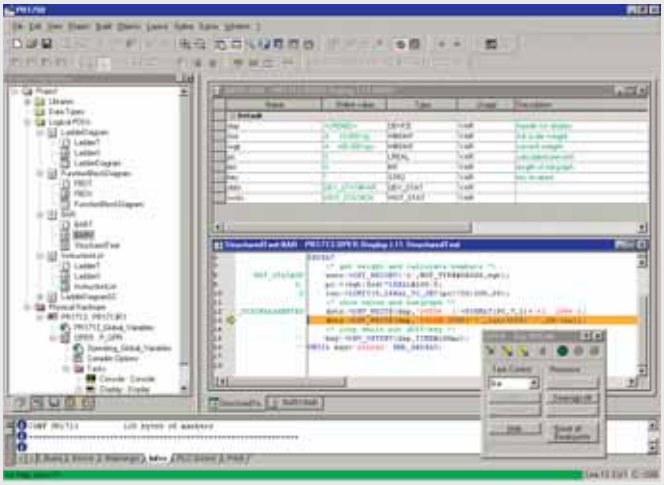
Integrated simulation
Furthermore, the fully graphical tool has a built-in simulation feature for testing the programs you write. Your controller or terminal is emulated on the PC for testing. More than just a simulation in program code, this feature presents an image of the actual user interface as displayed on the controller or terminal, as well as a visualization of inputs and outputs. This makes it possible to run through a number of sequences and different versions without undue effort or costs. In the process, the controller configuration is automatically checked for correlation with the I|O cards used by the program.

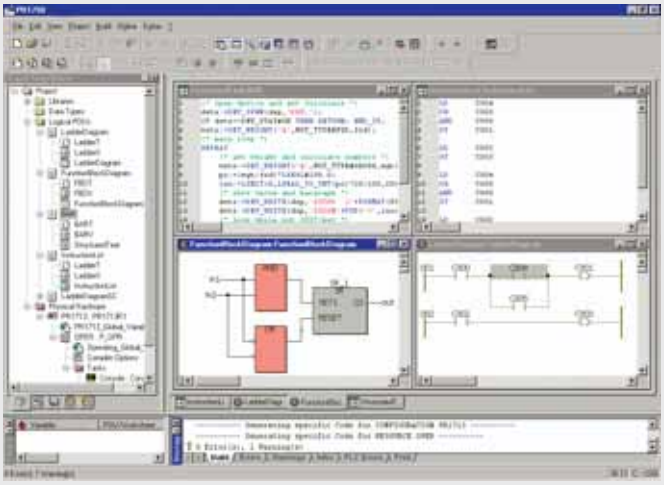
Testing on the PC also saves a great deal of time, because you can try out your program without connecting the controller or downloading any software. Moreover, just testing the program sequences can quickly lead to new ideas for additional application-specific design options.

Generating program code
For more extensive and complex programming tasks, the fully graphical user interface can automatically generate the program code for a complete IEC 61131-compliant project. The intelligent interface between the fully graphical user interface and the PR 1750 programming tool creates the entire project in "Structure Text" code in the PR 1750 project environment.

In many cases, a fully graphical development environment is used by professionals to avoid having to begin with a blank project. The initial effort required can be reduced significantly by reproducing the first steps and the basic program structure and then having the project automatically generated. This ensures compliance with IEC 61131 and compatibility with programming language syntax. Thus the initial project phase is both simplified and accelerated.

Programming in IEC 61131





Textual and graphical editors
The following languages can be used in combination in IEC 61131 programming:

Textual languages:
- ST (Structure Text)
- IL (Instruction List)

Graphical languages:
- FBD (Function Block Diagram)
- LD (Ladder Diagram)

Structure Text is similar to the high level languages C and Pascal. Instruction List is a simple, instruction-list oriented language comparable to Assembler Language. Intelligent text editors are available for both of these, which can relieve programmers of tedious searching and writing tasks. The "Edit Wizards" offer a choice of language elements and function blocks in selection lists. The "IntelliSense" feature fills in variables and parameter names. "Highlighting" emphasizes key words by marking them in color to improve legibility of text.

The graphical editor creates programs using Function Block Diagram (FBD) and Ladder Diagram (LD). These languages can be combined in a single worksheet. Here, too, color highlighting of function blocks supports legibility, and Edit Wizards are available.

Online debugging
Comprehensive debugging and diagnostics functions make it easy to test programs and shorten both troubleshooting and commissioning times. Variables can be observed "online" at runtime. The values in variables can be recorded by a logic analyzer and stored in a file, similar to data logging. Break points can be inserted in the code to stop processing and then continue it line by line. The functions "Single Step," "Step Into," "Step Over," etc. are integrated for this purpose. Furthermore, parallel modification of variables is available. This makes it easy to find and eliminate errors quickly and efficiently.

Simulation of process I|Os
In addition, different states and reactions of inputs and outputs in the controller can be simulated. Certain procedures and complex reactions of process systems can be recreated and tested without connecting external I|O modules. This simulation is implemented in real time thanks to a sophisticated "embedded" PLC simulator.

The Help system
PR 1750 is equipped with a context-sensitive Help function that supplies topics on all components of the program. You can open dialog-specific Help by pressing F1, or select a topic from the Help Contents. The "Getting Started" feature provides a comprehensible introduction to the programming side of control software.

Ready-to-use projects
A number of ReadyToGo projects are integrated in the online Help program. These projects can be run from within the Help program — in other words, opened, compiled, loaded in an X-Family controller and executed. This facilitates working with PR 1750 for entry-level programmers while it reduces the time required to create programs.

Specifications: PR 1750/60

PR 1750/60 System

Program development tool for
- X-Family controllers
- Combics Pro terminal
- IEC 61131-3-compliant programming

Fully graphical program creation

- Fully graphical tool, runs in Eclipse® Software

Function blocks for
- Program sequences
- User dialogs
- Table processing
- Digital filters
- PID controller
- Weight value function
- Batching functions
- PLC program
- Mathematical functions
- and much more

Integrated simulation for X-Family controllers and Combics Pro
- Keypad operation
- Text input | output
- I | O simulation
- Print function

Views
- Project tree
- Standard graphics
- Text
- Resources
- I | O view
- Customer-specific

Languages in the fully graphical tool
- English
- German
- Other languages can be implemented
- Online Help in German and English

Lib-Functions
- Self-programmed functions can be protected in a library (Know-how protection!).

Programming in IEC 61131

- ST (Structure Text)
- IL (Instruction List)
- FBD (Function Block Diagram)
- LD (Ladder Diagram)

Textual editors with
- Edit Wizards
- IntelliSense
- Highlighting

Debugging function
- Variable online
- Break points
- Single Step
- Step Into | Step Over
- Logic analyzer
- Cross reference

Language in the IEC 61131 tool environment
- English

Help
- Online Help
- Context-sensitive Help
- ReadyToGo projects
- Automatic project generation

Minimum requirements (PC)
- Windows XP SP2
- Pentium III, 750 MHz
- 512 MB RAM
- 1 GB space available on hard drive
- Monitor: min. 1024 × 768
- RS-232 serial interface or Ethernet network
- Java platform (included in delivery)

Ordering Information

Model	Description	Order number
PR 1750/60	Graphical development tool for IEC 61131-compliant programming of weighing controllers. Full programming capability for any number of controllers of the X-Family series and Combics Pro terminals.	9405 317 50601

Note: Starting with the PR 1750/60 version, the PR 1730 controllers are no longer supported.

Specifications subject to change
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