

PLC DocGen

Automatic Documentation Generation for PLC Programs

About the importance of documentation

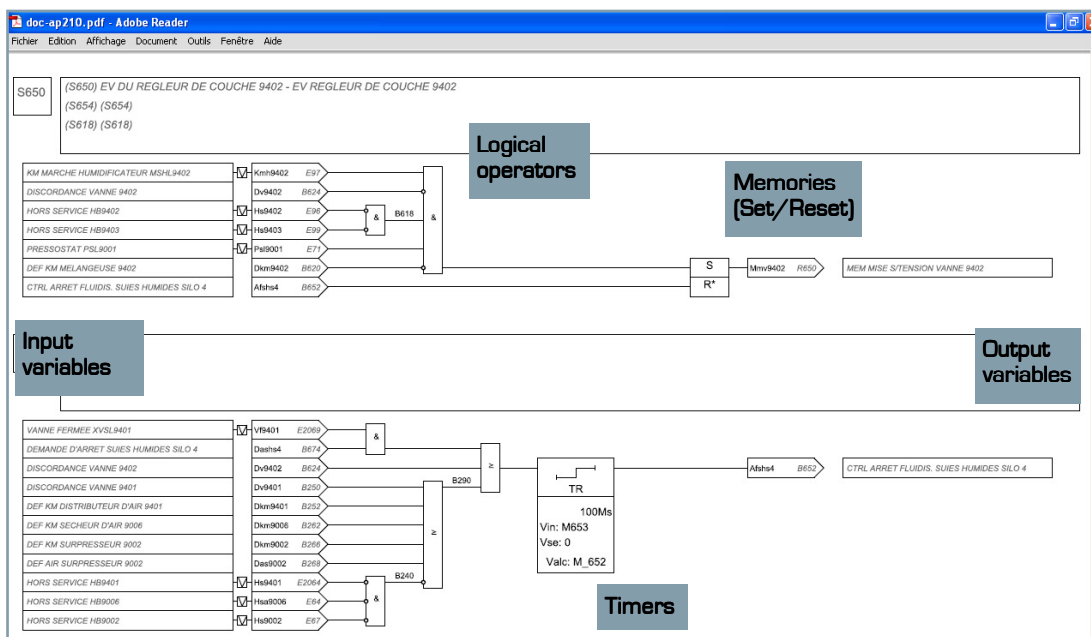
During its whole lifecycle, a typical PLC program will be read and modified by many contributors : development and commissioning teams, maintenance and modernization technicians and engineers, project managers... All will have to quickly and easily understand a program they often didn't develop themselves, especially if they start a new job from some legacy code. Being efficient when modifying some unknown and sophisticated code is always a challenge. Thus, any accompanying document is welcome.

Unfortunately, the code is often the only available documentation ... and it may be poorly commented. Also, when some specifications are available, they generally are a mere high level view and linking them to the actual program may be tricky. Even if a proper documentation has been written along with the program, it has to be maintained when the code is modified... which is costly and thus frequently neglected. The worst situation is probably when there was only a physical copy of the documentation ... which became unreadable because it was not stored properly.

A crucial need during the whole lifecycle

Working on an undocumented program is always a major loss of time:

- ◆ **Commissioning teams** miss a clear link between functional specifications and the algorithms in the code, thus wasting hours during setup and debugging.
- ◆ **Maintenance technicians**, working in end-user's PLC controlled facilities, have to be able to quickly fix erroneous programs so that production may restart as soon as possible. Thus, they need a clearly documented high level model of the behavior of the program.
- ◆ **Modernization teams** wanting to convert — and potentially rewrite — an existing legacy program for a more current hardware shall refer to the original specification and design documentation to make sure that they stay consistent with the intended behavior of the system.
- ◆ Finally, **project managers** which have to estimate workloads based on (too) high level specifications may not be able to fully understand the actual complexity of the job if they don't have access to a more detailed documentation closer to the program itself.



Pictograms

Figure 1: Example of documentation generated by PLC DocGen





Key Features

- Automatic generation to PDF and SVG (Scalable Vector Graphics) standard formats
- Better readability and thorough visibility of complex equations
- Transformation of any IEC 61131 language (but function block diagram) into flowcharts independent from the actual sequential execution of the program
- Guaranteed consistency of the automatically generated documentation
- Flexibility of the documentation templates to take into account evolving format specifications
- Single technological approach and consistent format even for heterogeneous (multi-vendor) pools of PLCs

Automatic Generation of Flowcharts

Having access to a precise and synthetic documentation is thus key to the efficiency of all contributors during the whole lifecycle of PLC programs. However, manually writing documentation is tiresome and error-prone. **The need for a perfectly consistent format and the tediousness of the task argue for an automated tool-based approach; that's exactly what PLC DocGen offers.**

PLC DocGen automatically generates a dataflow oriented view of a PLC program (from inputs towards outputs) represented by equations and flowcharts, thus abstracting the actual sequential execution of the program. This view is a perfect intermediate formalism between specifications and the code itself.

This view is independent from the programming style and the type (and vendor) of PLC hardware on which the program runs, thus ensuring a consistent formatting for all documents. PLC DocGen may use as a parameter any kind of documentation template (title blocks, symbols...) and then apply it to all documents it generates. It is based on a sound technological approach valid for any PLC in the market, making it the perfect companion to any reverse engineering activity be it for new developments based on legacy code or for maintenance and modernization.

PLC DocGen Methodology

Flowchart generation is offered by Itris Automation Square as a service that follows a clear and rigorous methodology:

- **Gathering of the programs to be documented** and transfer of all files to Itris Automation Square.
- **Definition of the documentation template** through the actual documentation generation for one of the supplied programs. The template will contain models of front pages, title blocks, pictograms, symbols, tables of content, blue-print backgrounds, numbering... The template is then formally approved.
- Actual **automatic generation of the documentation** with PLC DocGen according to a schedule that takes into account the priorities of the project.
- **Documentation validation** through peer proofreading.
- **Formal delivery of the documents in PDF and SVG formats** applying the template defined previously. The documentation may be easily maintained and modified subsequently thanks to the flexibility of the SVG format.

Availability

PLCs supported:

- Schneider Electric SMC
- Schneider Electric April/Orphée
- Schneider Electric TSX Série7
- Schneider Electric Unity (Premium, Quantum and M340)
- Siemens Step 7
- Siemens Step 5

Training and consulting services for:

- The definition of documentation templates.
- The deployment of an organization wide systematic and consistent approach to PLC programs documentation.