ITRIS Automation Square

Product Datasheet

PLC Checker

Automatic Coding Rules Checking

Challenges in Automation Today

As PLC programs become bigger and more complex, the need to ensure their quality has never been greater. Latent bugs and difficulty in maintaining complex code slow development programs, delay deliveries and increase costs. Also, even when coding rules are defined, there are often no tool to verify the compliance of a program with the rules. **As a bottom-line, maintenance costs, supported by industrial end-users, are heavy and unpredictable.**

Conventional quality methods for PLC programs are increasingly inadequate. They can't ensure readability and maintainability at an affordable price. Rules are difficult to formalize and exhaustive compliance is impossible to verify. As a consequence they are considered as poor acceptance criteria.

Today's PLC programs require new solutions that are capable of automating validation of the compliance with coding rules and thus reducing maintenance costs.

Automating Coding Rules Verification

PLC Checker is the answer to these challenges. It automatically analyses PLC programs and validates exhaustively their compliance with generic industry-wide coding rules and - if needed - rules specific to an industrial sector or a process. It can also generate certified sets of results for external audits.

In contractual relationships, PLC Checker defines the required quality level to be attained and the acceptance tests to be performed by contractors. By using PLC Checker, contractors gain credibility by demonstrating the quality of their programs with the most innovative solutions.

Examples of Rules Checked

Readability:

- Comments are present and well formatted
- Naming follows coding standard conventions

Reliability:

- Each input is read, each output is written, each default is evaluated
- All sections are present and in the specified order
- No dead code or subroutine called
- No code as comment
- Reserved for future use variables are not used

Modularity:

- The right variables are handled correctly at the right place

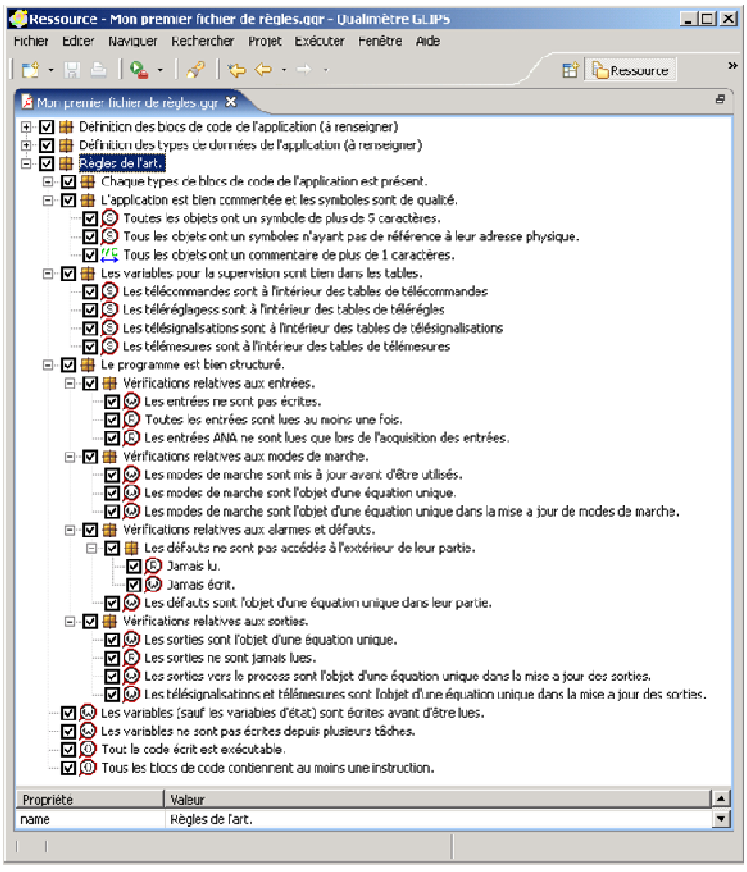

Figure 1: Example of rules file for PLC Checker

Architecture of the Product Offering

PLC Checker is made of three modules:

PLC Checker Rules Editor is used to create and edit rules files. It's a free standalone software. Users are guided and can rely on pre-existing standard sets of rules. It is typically used by quality and methods teams. It can also be used by development teams to fine-tune the rules before launching an analysis.

PLC Checker Engine does the actual coding rule verification. In runs on Itris Automation Square servers in a Software as a Service model and thus doesn't require any capital expenditure nor trigger any maintenance cost. It takes as inputs a PLC program and a rule file and produces as an output an analysis report. The report can be opened with PLC Checker Viewer.

PLC Checker Viewer is used to navigate in reports produced by PLC Checker Engine. It features advanced filtering capabilities to help focus the review on the most relevant classes of errors. As PLC Checker Rules Editor, PLC Checker Viewer is a free standalone application.

Benefits

Using PLC Checker provides benefits to all actors of the PLC programming industry.

Quality and method teams can more easily formalize rules and thus better communicate with the development teams.

Design and development teams benefit from an easier, exhaustive and automatic verification of the compliance with the requested coding standard. The effort to learn the naming convention is greatly reduced. Also, code checking can be done as soon as possible in the development phase. The testing phase is thus drastically shortened and can be focused on functional issues.

Audit teams have objective criteria for acceptance testing and they can measure the compliance with these criteria quickly and easily with a simple click.

Maintenance teams—who are the ultimate actors in the PLC program life cycle—benefit from a program that is easier to read and maintain. They can thus work far quicker in case of bug or to introduce evolutions.

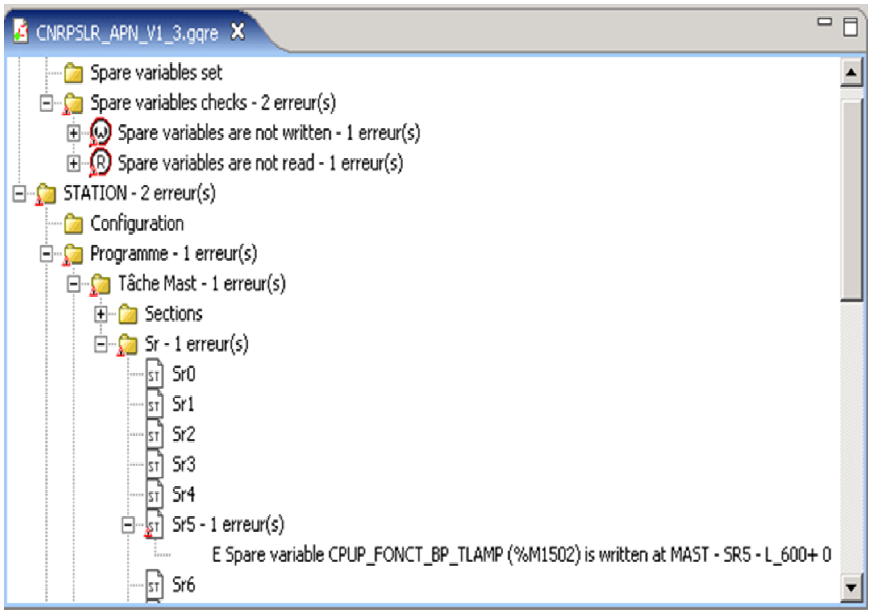

Figure 2: Analysis results file produced by PLC Checker

Availability

Usage schemes:

- For audit purposes: single runs
- For development purposes: unlimited analyses of a given program

PLCs supported:

- Schneider Electric Unity-Pro
- Schneider Electric PL7 Pro
- Siemens Step 7
- Rockwell RSLogix

Training and consulting services for:

- Formalization of quality methods
- Coding rules creation and edition—taking into account the state of the art and rules specific to a given application
- Analysis results review