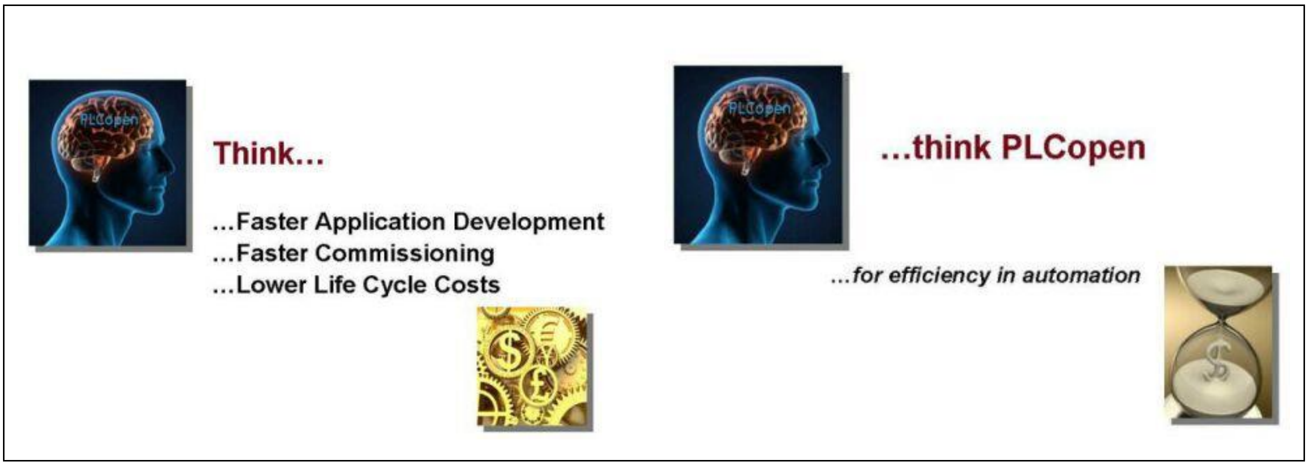
Benefits of PLCopen membership

Introduction

PLCopen creates efficiency in industrial automation by harmonizing logic, motion, safety, communication and data exchange.
Via the PLCopen specifications you can reduce costs through:

- Faster application development
- Reduced commissioning time
- Reduced life cycle costs
- PLCopen supports operational improvements


Think...
...Faster Application Development
...Faster Commissioning
...Lower Life Cycle Costs
...think PLCopen
...for efficiency in automation

Faster Application Development

Common Look and Feel

- Allows selection from a number of Integrated Development Environments (IDEs) which implement the IEC 61131-3 automated industrial control programming standard.
- IEC 61131-3 normalizes the automation programming process and PLCopen extends this normalization into the domains of motion control, safety and communication.
- Training in one implementation of the IEC standard and the PLCopen extensions to the standard is readily transportable to other implementations.
- A standardized development interface allows individual providers and users to concentrate on the qualities that truly differentiate their work rather than on learning differences in inconsequential foundational behavior of the software.

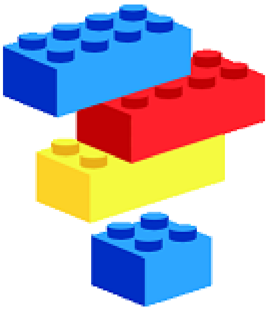
Flexible Language Selection

- Allows the developer to select one of five languages:
- Sequential Function Chart (SFC) – Top level state machine sequencing behavior;
- Function Block Diagram (FBD) – Intuitive data flow presentation for trouble shooting and logic tracing;
- Structured Text (ST) – ideally suited for complex control algorithms requiring no exposure to technician for interpretation/intervention;
- Ladder Diagram (LD) – suitable for simple Boolean logic algorithms;

- Instruction List (IL) – similar to LD as best suited to simple algorithms.
- Each language has unique strengths and weaknesses.
- Suggested “best practices” indicate which will serve most appropriately in each situation. Suggestions include:
- SFC - for top-level execution control of sequential operations;
- FBD - for technician interpretation of data flow;
- ST - to create User Derived Function Blocks for own usage, with “hidden” and/or complex code algorithms.

Modular, Reusable Code Design

- Allows the developer to archive and reuse blocks of code that have well defined and tested functionality and minimizes errors created by completely new coding.
- The organization of code into modular, reusable units allows a “lego block” approach to programming.
- Code that is written and tested in any of the 5 languages can be archived along with its associated data for rapid reuse in any iterative development cycle.
- This greatly reduces the time needed to code subsequent projects with similar functional requirements.
- The prospect of reuse justifies rigorous validation of individual functional objects and enhances the robust behavior of these objects.
- Although additional time is spent on initial code design and validation, the return is particularly significant in regulated environments like pharmaceutical and medical device manufacturing.
- Reuse of code minimizes the risk of error introduction during “recoding”.
- Technicians do not need to interact with code that is encapsulated in well designed and tested blocks.



Reduced Commissioning Time

Logic/motion/safety/communication integration = one configuration tool

- Most PLCs and Programmable Automation Controllers (PACs) are managing all domains of industrial automation today:
  - Logic – Robust standardization implementing IEC 61131-3;
  - Motion – Normalized motion programming using PLCopen motion function blocks;
  - Safety – Integrated safety functionality during system development;
  - Communication – OPC Unified Architecture provides platform and manufacturer-independent information and communication architecture.
- PLCopen architecture allows the integration of all domains into one unified development environment.
- PLCopen’s hardware independent approach encourages cost-reducing “best of breed” hardware integration.

Data transparency = faster configuration and integration with existing equipment

- Strong data typing reduces “type-mismatch” induced errors.
- PLCopen identifiers allow for industry specific naming conventions.
- Globally recognized namespace conventions enhance troubleshooting by simplifying data tracing.
- OPC UA simplifies integration of field data from diverse sources.

Fewer code errors = less troubleshooting time

Reduced Life Cycle Costs

Hardware independent software = integration of “best of breed” hardware

- Compliance certification insures predictable behavior across a broad spectrum of automation hardware.
- Selection of the best available hardware and integration through standardized communication strategies greatly reduces system design costs.

PLCopen = Data transparency = Basis for OEE (Overall Equipment Effectiveness)

- Data transparency and consistency guarantees rapid concise equipment monitoring.
- Powerful modular libraries provide standardized and customized data interpretation for root-cause analysis.
- Modular software design encourages modular system analysis.
- OEE (Overall Equipment Effectiveness) is a number described in terms of a percentage and is the product of three terms expressed as percentages:
- Availability - percentage of time the machine is available for work vs. the time scheduled for work. (uptime);
- Performance - speed at which work is performed as a percentage of designed speed;
- Quality - represents good units produced as a percentage of total units.
- The formula is: OEE = Availability x Performance x Quality.

Faster training = cross-disciplinary technicians

- Technicians trained in PLCopen strategies have “cross-platform” migration opportunities.
- Modular code design allows for modular training design.
- Certified PLCopen training centers assure consistency of training.
- Object Oriented Program design leverages skills of “non-industrial” programming professionals.

Modular code = concise troubleshooting (reduced downtime)

PLCopen Supports Operational Improvement

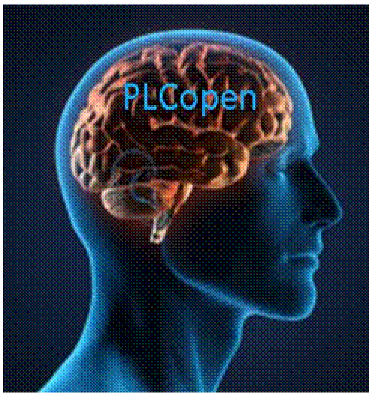
PLCopen helps manufacturers:

- to identify operational inefficiencies;
- to perform root cause analysis;.
- to manage and improve production operations in their machines and production lines.

This allows manufacturers to make informed decisions about manufacturing processes and identify ways to drive operational improvement.

PLCopen provides the basis to show factors such as:

- equipment downtime;
- changeover effectiveness;
- waste and line efficiency;
- link downtime events to the specific cause.



Think forward…

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…for efficiency in automation

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