LOLITech
Logiciel Libre et Technologie

FEUP Universidade do Porto
Faculdade de Engenharia

# Beremiz

## The Free and Open Source IEC 61131-3 Automation IDE

CANopen

PLCopen XML EXTENSIBLE MARKUP LANGUAGE

SVG

# Open Source for Open Standards

- Despite of open standards such as IEC 61131, PLCOpen and CanOpen, control engineers cannot easily transfer programs between vendor solutions.

- To this end, the Beremiz Project produce Free and Open Source software for automation :
  - Integrated Development Environment
  - Embedded runtime software
  - Automation, control and HMI software

# What is Beremiz ?

- Presentation covers the 4 sub-projects Beremiz relies on :

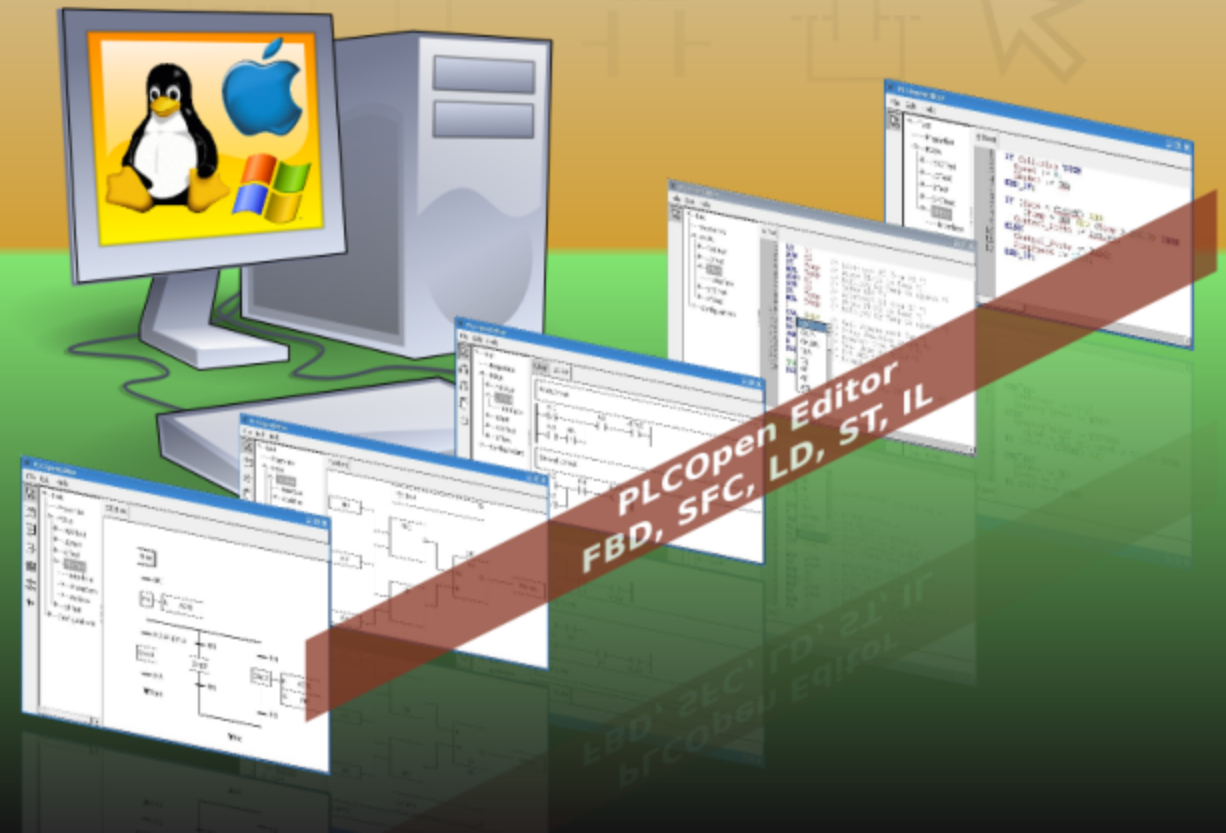




- 1 - The PLCOpen Editor
- 2 - The MatPLC's IEC compiler
- 3 - CanFestival
- 4 - SVGUI

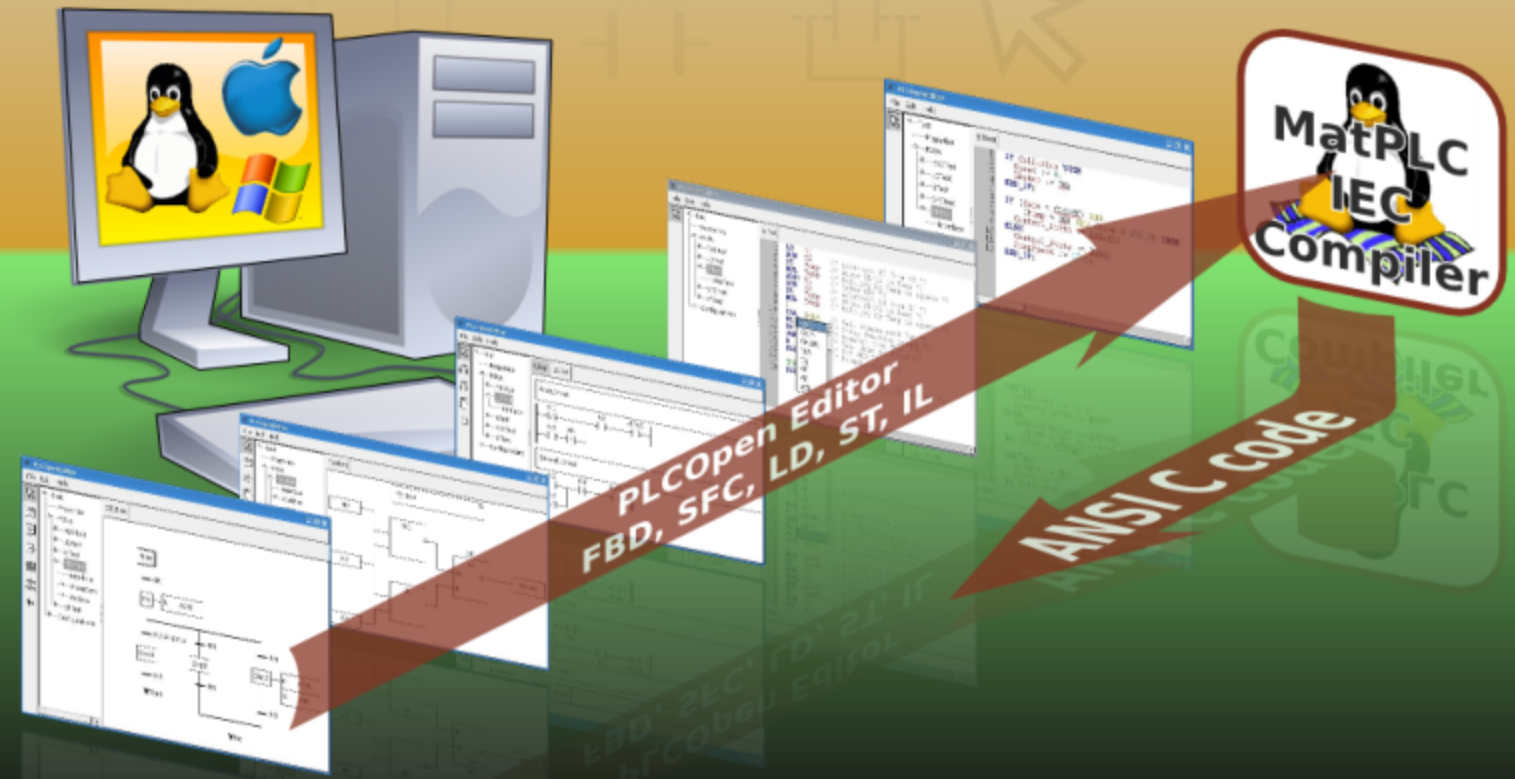
# What is Beremiz ?

**1.** Multi-platform **IDE** for **automation**



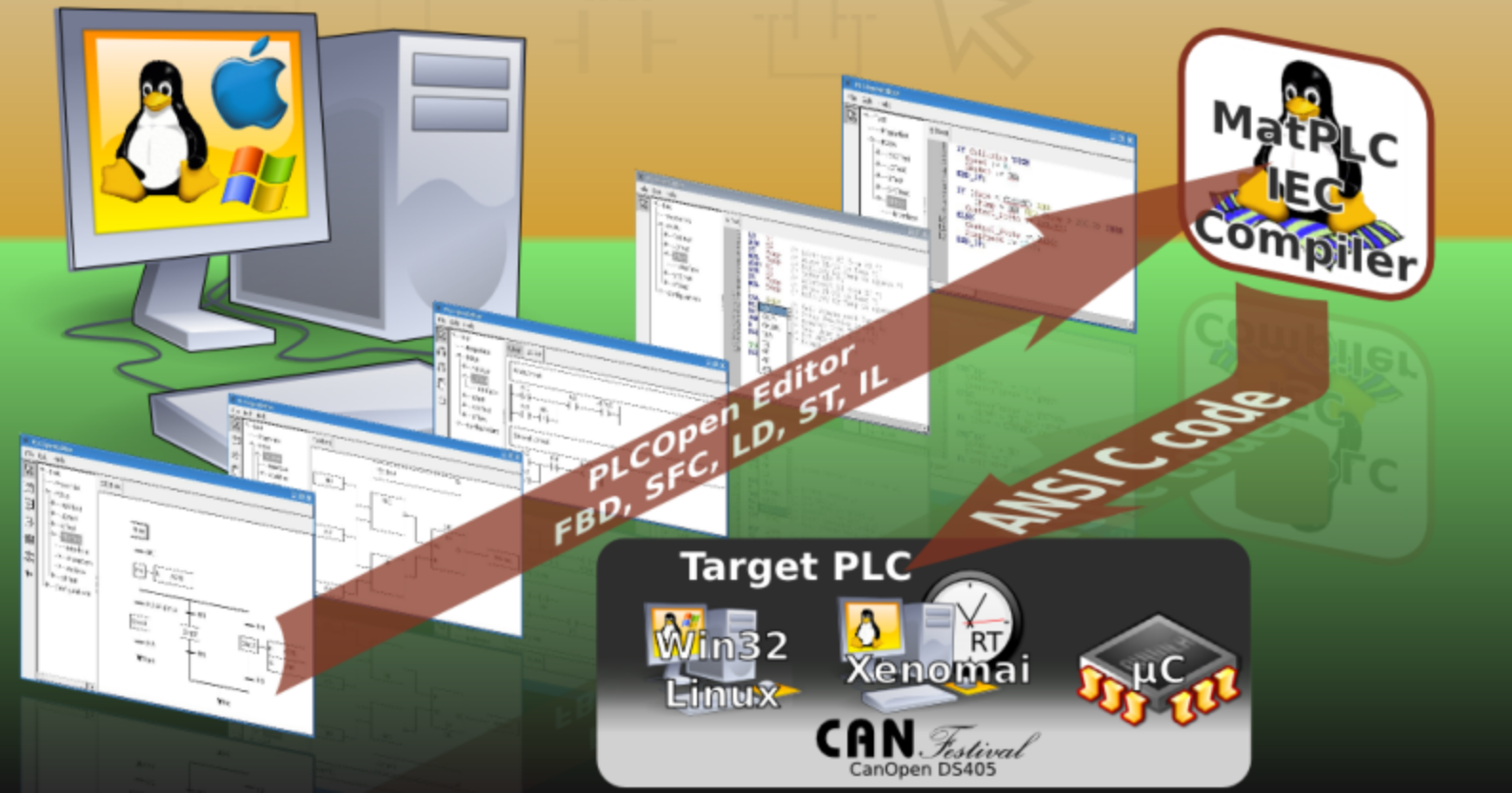
# What is Beremiz ?

## 2. IEC 61131-3 compiler



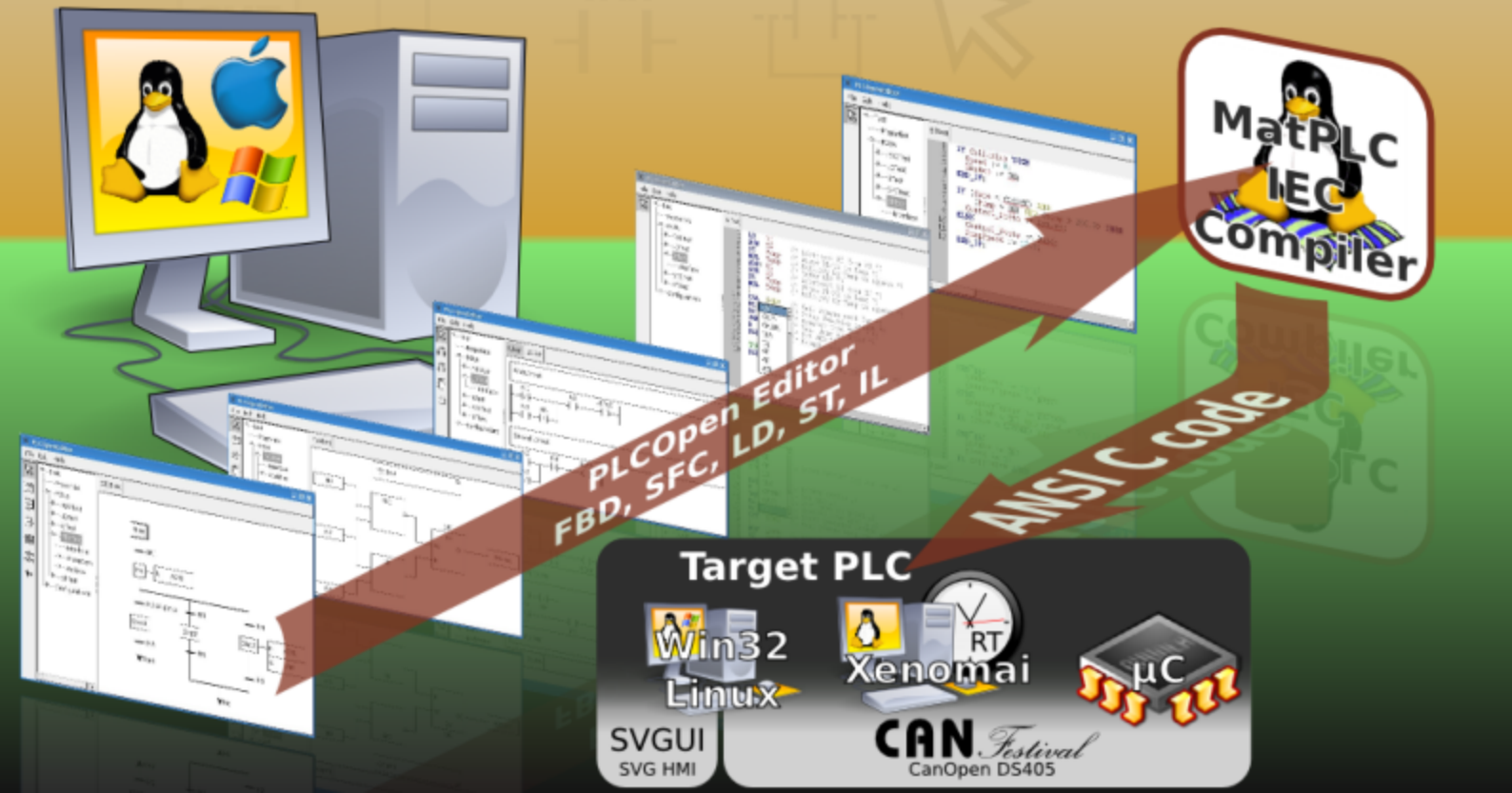
# What is Beremiz ?

**3. CANOpen** interface to physical I/O

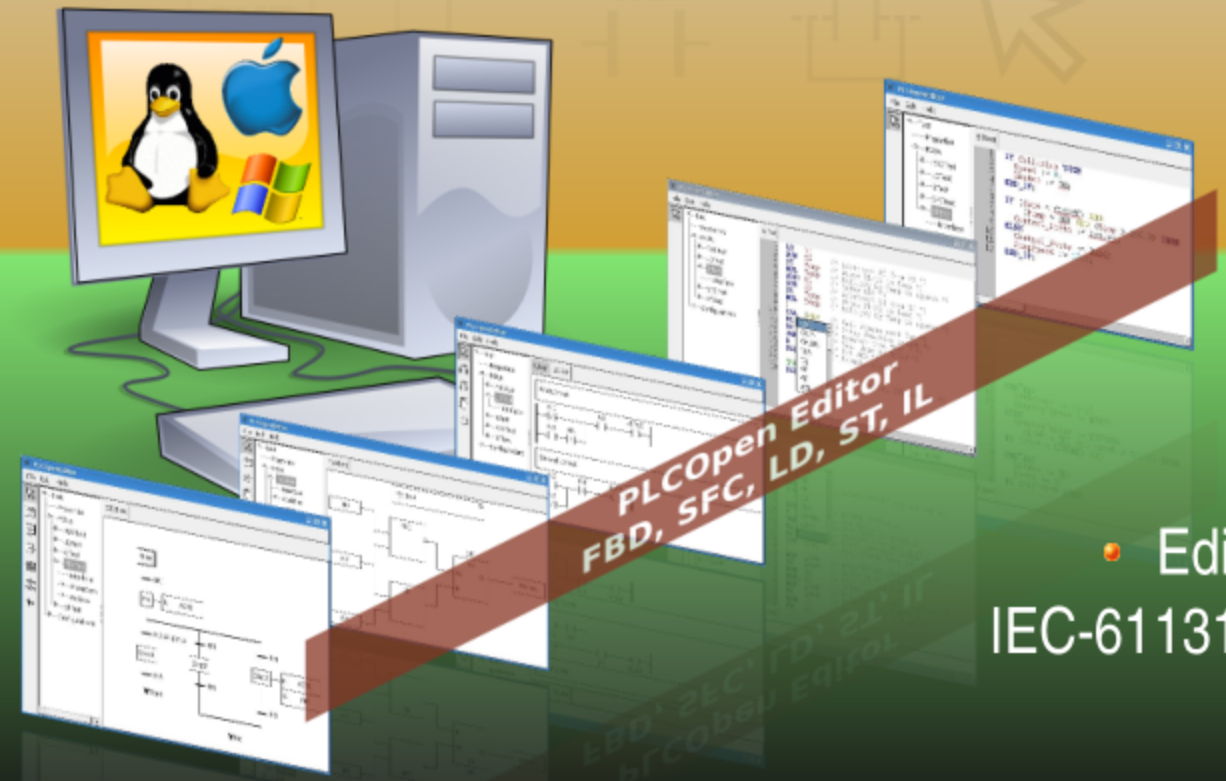


# What is Beremiz ?

**4.** automated **HMI** tool, based on **SVG**

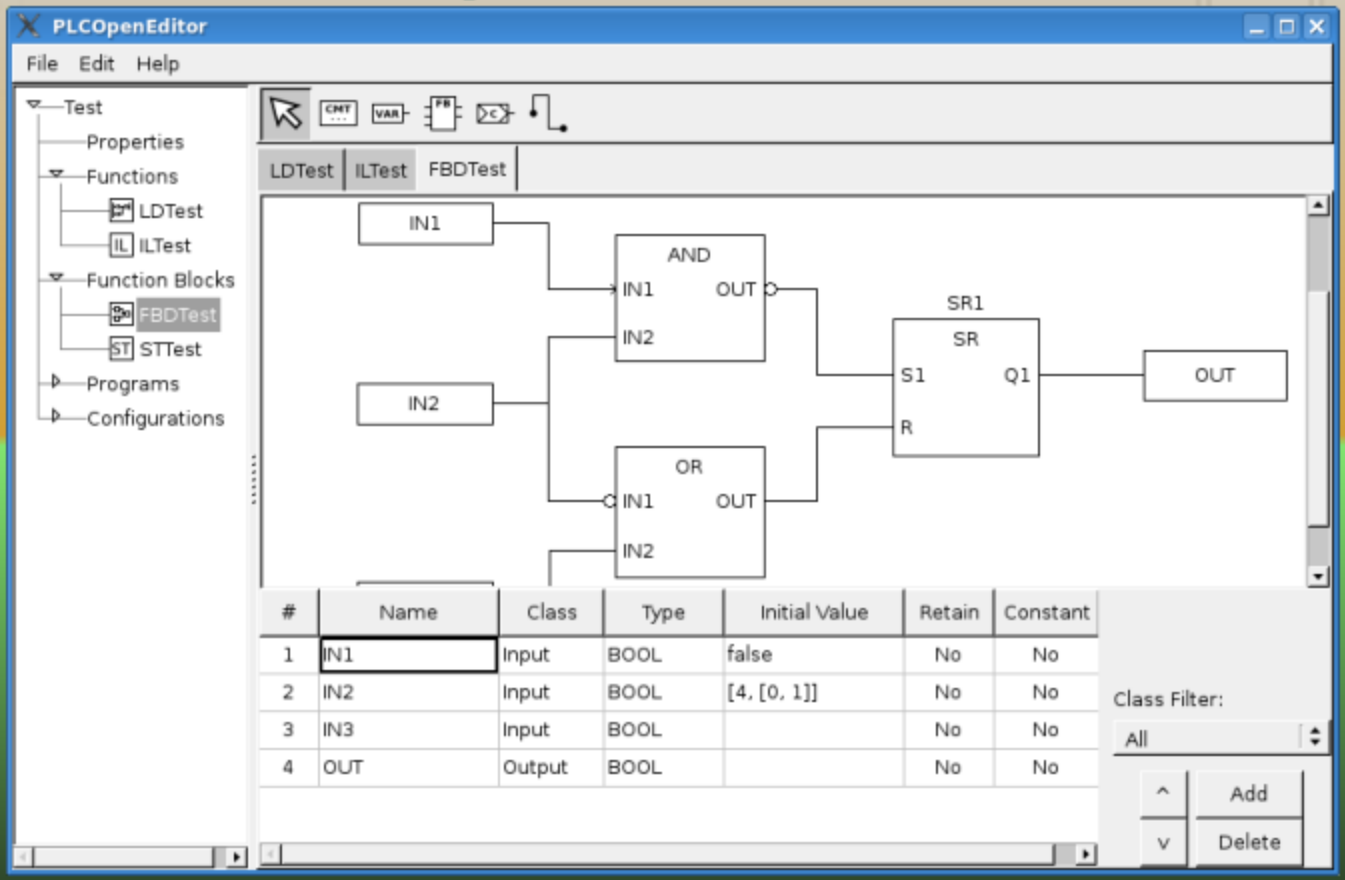


# 1. The PLCOpen Editor



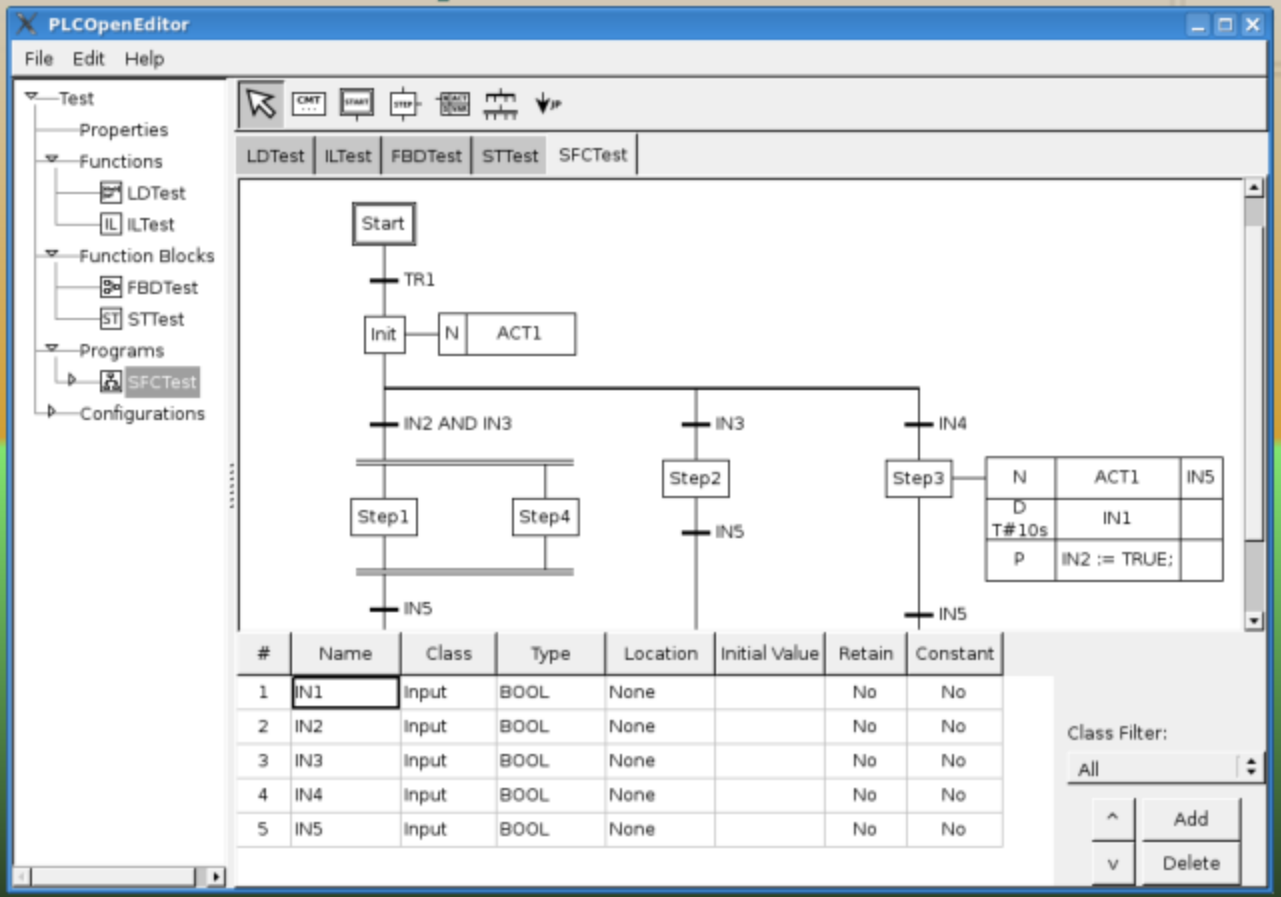

- Edits all 5 of the IEC-61131-3 languages

# 1. The PLCOpen Editor



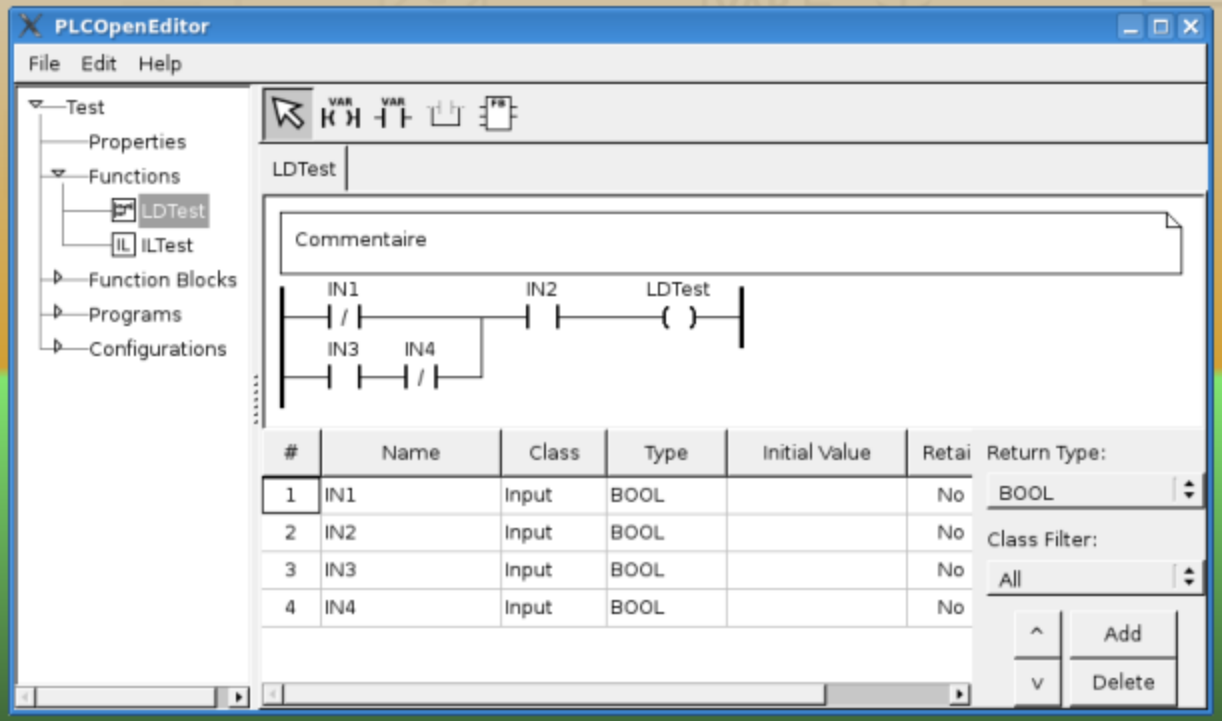

## Function Block Diagram - FBD

# 1. The PLCOpen Editor



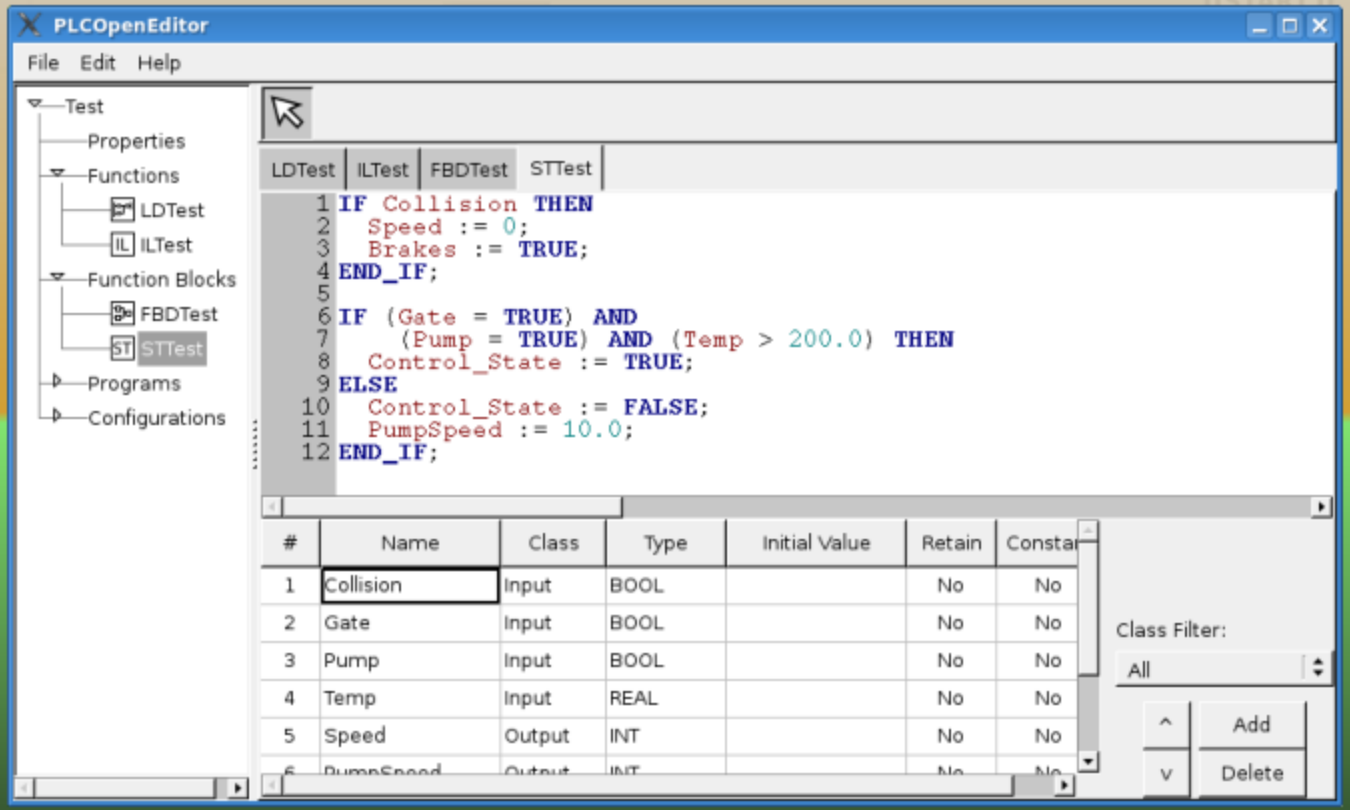

# Sequential Function Chart - SFC

# 1. The PLCOpen Editor



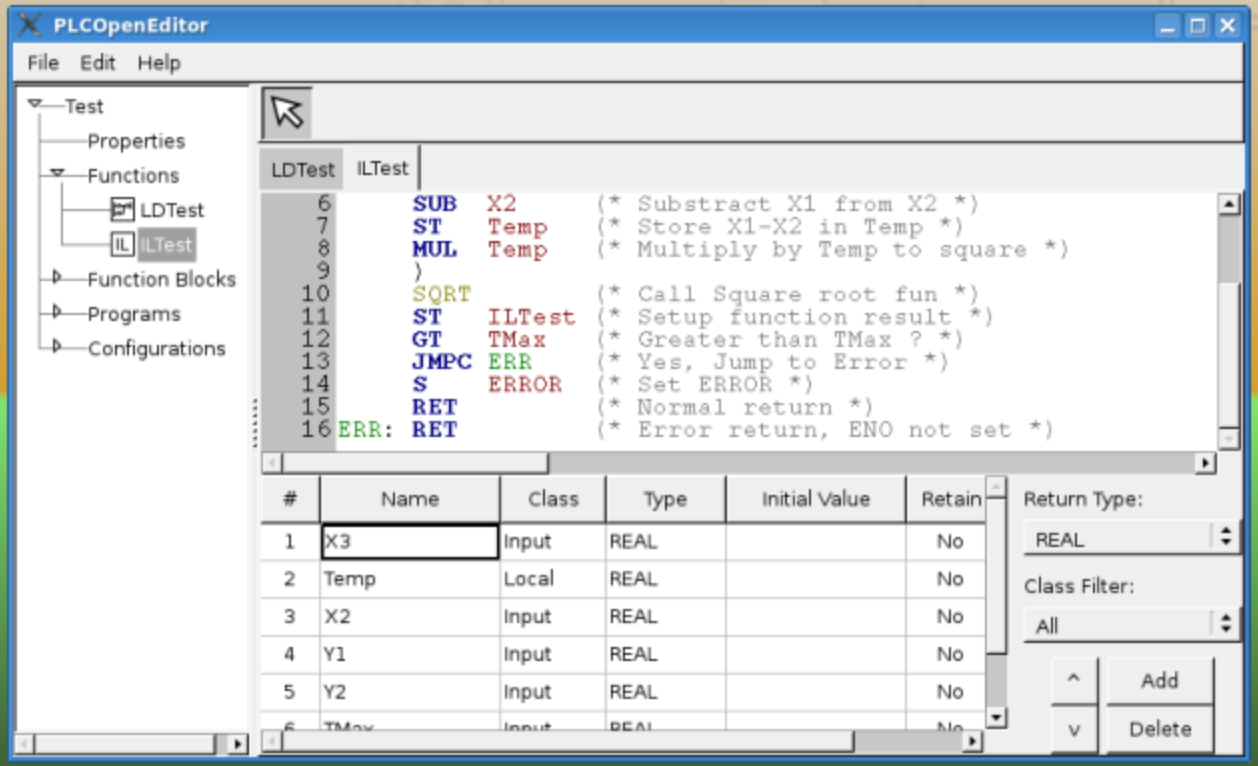

## Ladder Diagram LD

# 1. The PLCOpen Editor



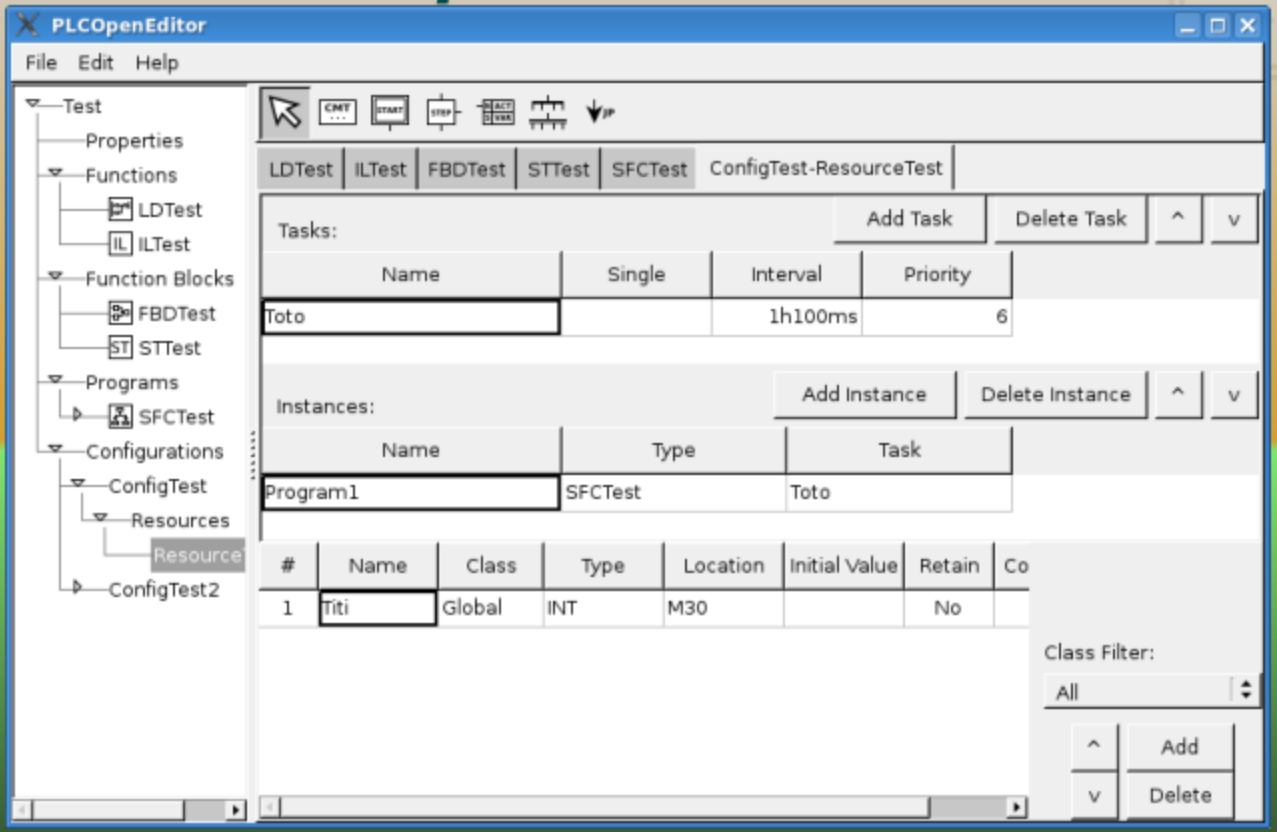

## Structured Text - ST

# 1. The PLCOpen Editor




## Instruction List
## IL

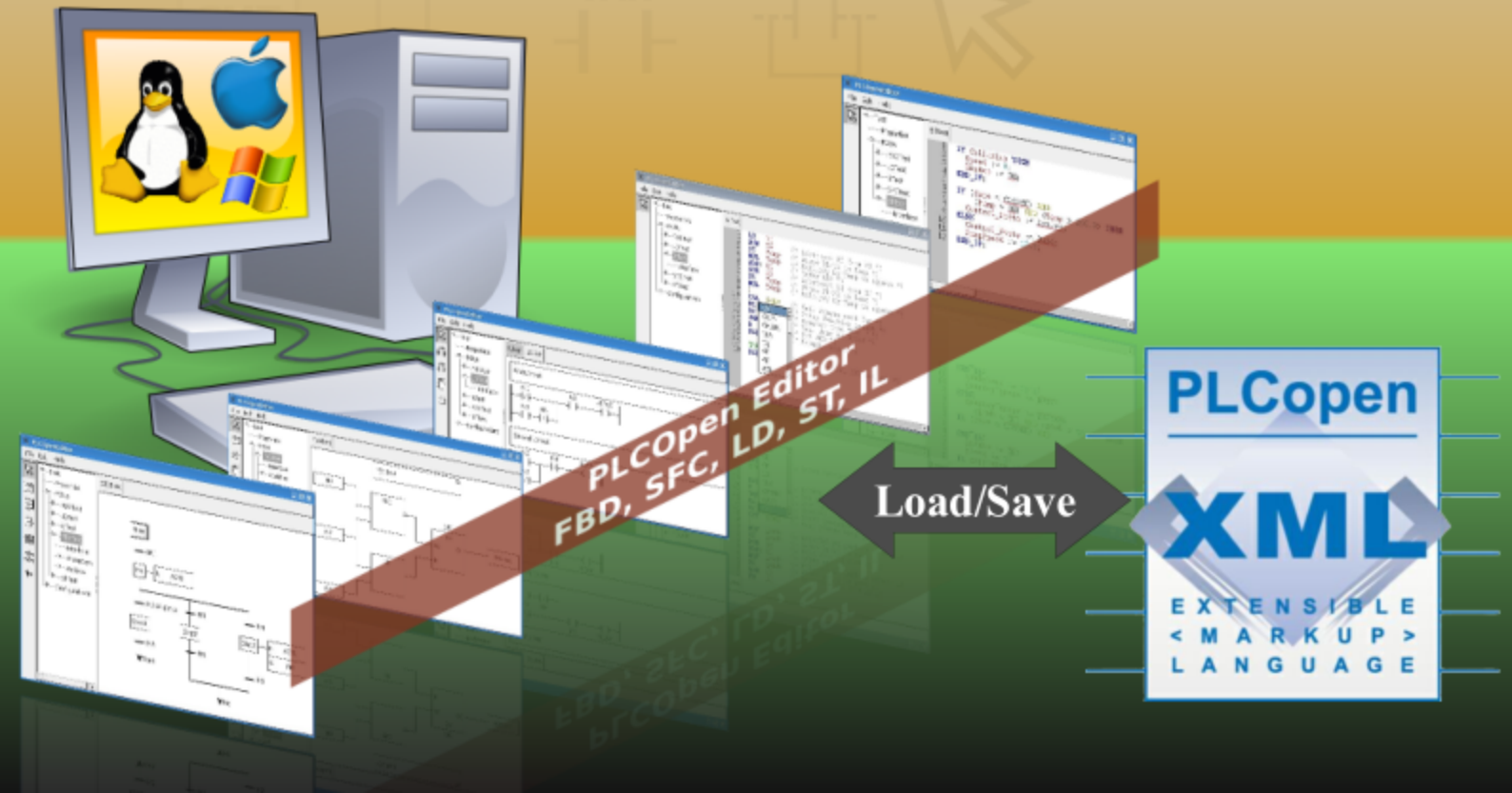
# 1. The PLCOpen Editor




## Configurations, Resources and Tasks

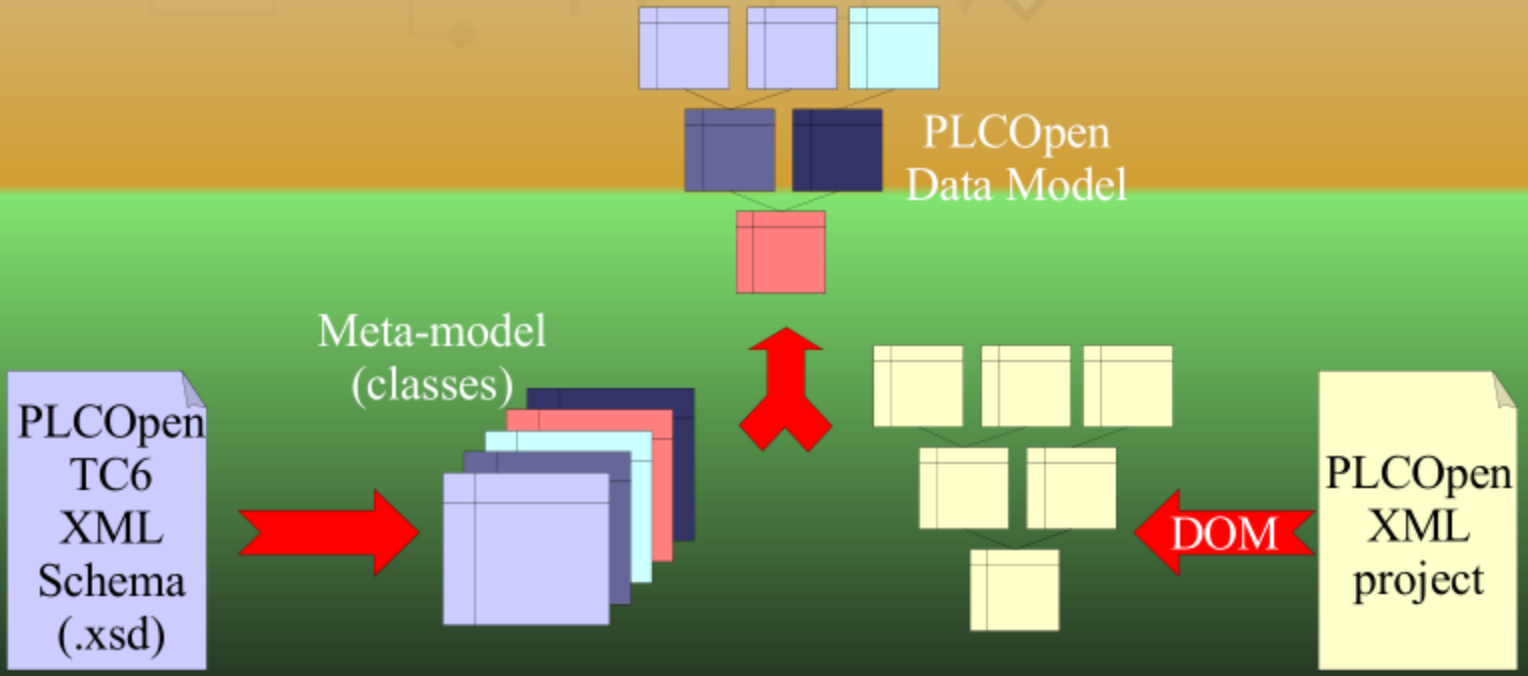
# 1. The PLCOpen Editor

- Saves and loads XML projects accordingly to TC6-XML



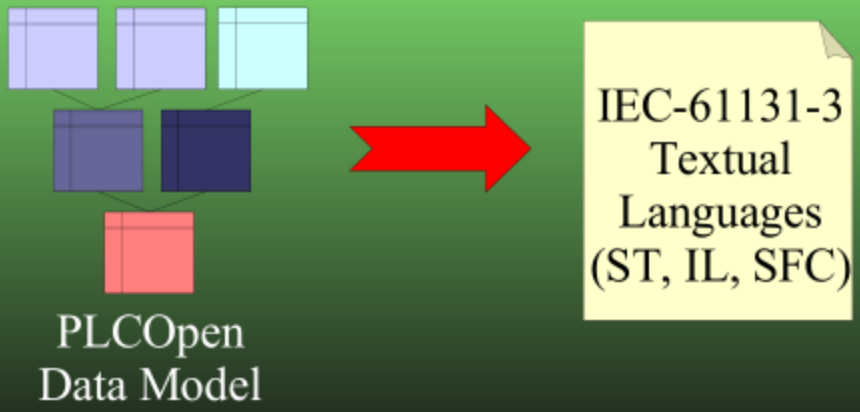
# 1. The PLCOpen Editor

- Data-model is based on TC6-XML XML Schema.

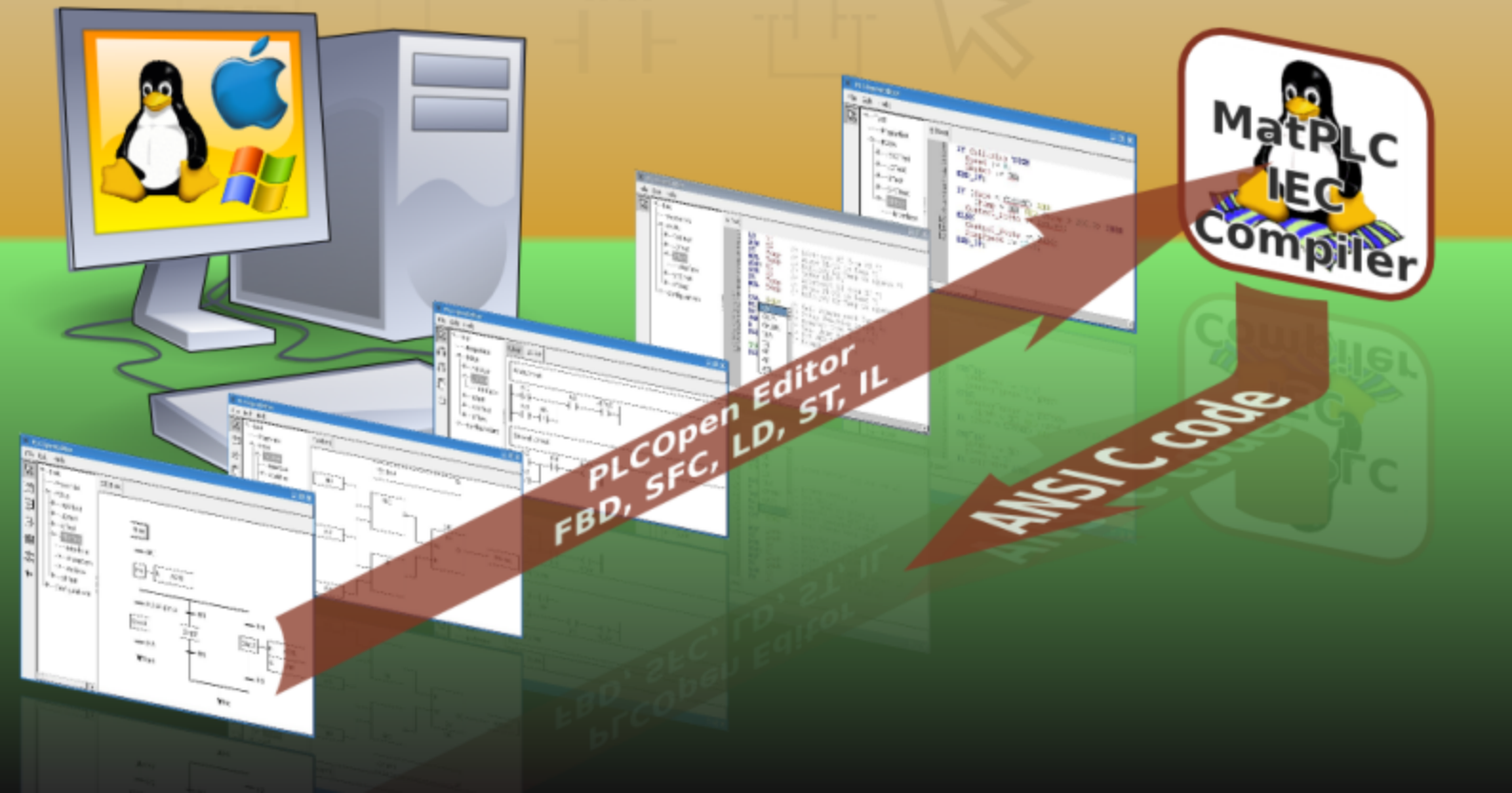


# 1. The PLCOpen Editor

- PLCOpen editor has built-in export filter that convert graphical languages to their equivalent textual form (FB, LD, SFC)=>(ST, IL, SFC)



# 2. The IEC to ANSI-C compiler

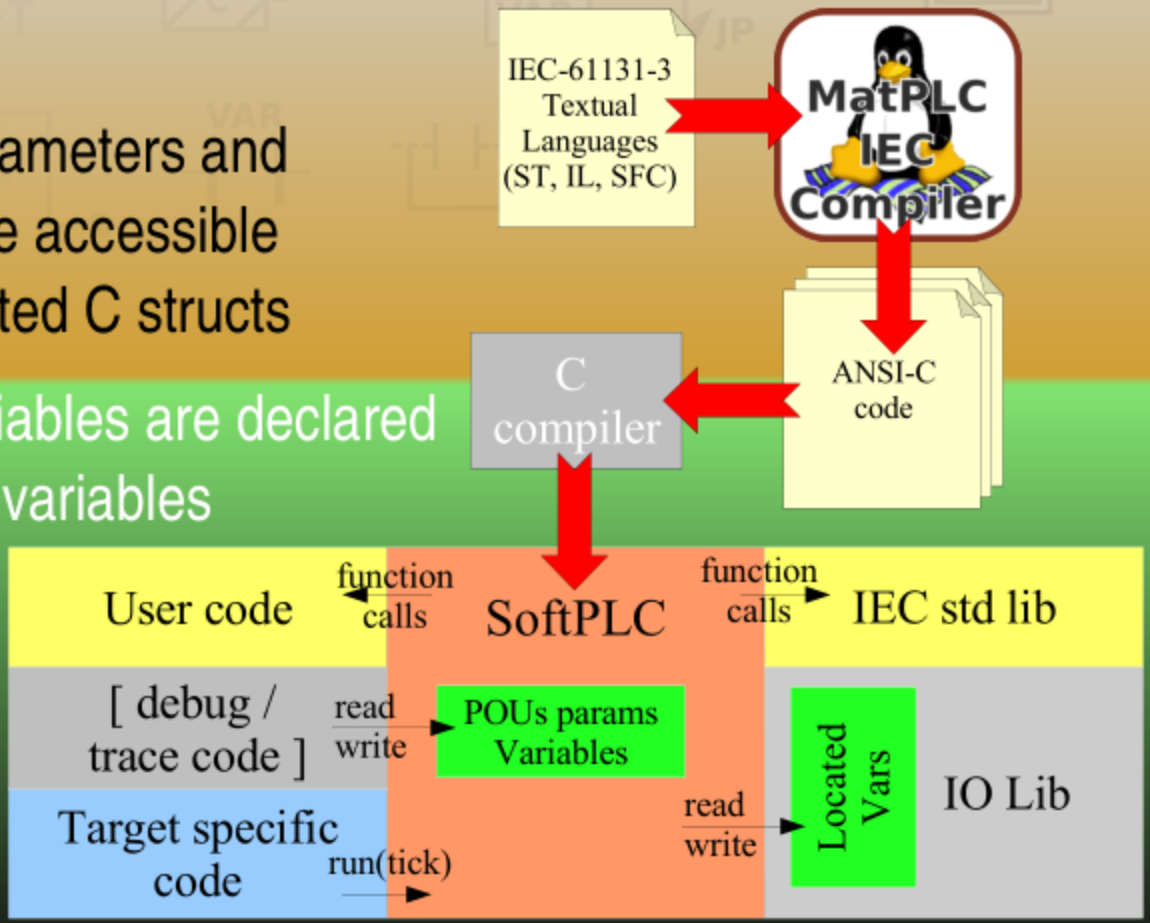


# 2. The IEC to ANSI-C compiler

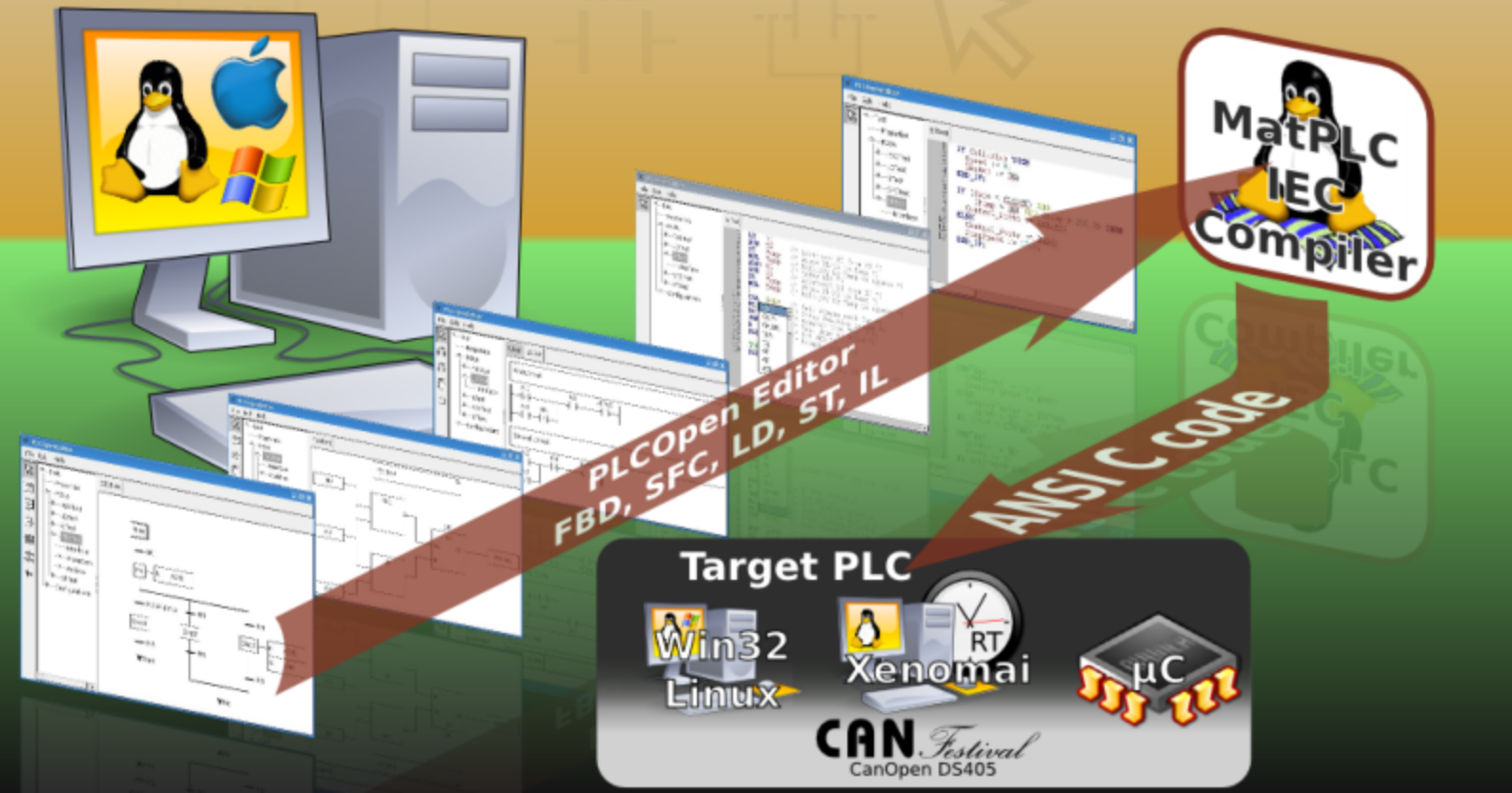
- Project started in 2002 by Mario de Sousa (U-Porto)
- Compiles ST/IL/SFC code into ANSI-C code.

# 2. The IEC to ANSI-C compiler

- All POU parameters and variables are accessible through nested C structs
- Located variables are declared as extern C variables



# 3. CanFestival CanOpen stack



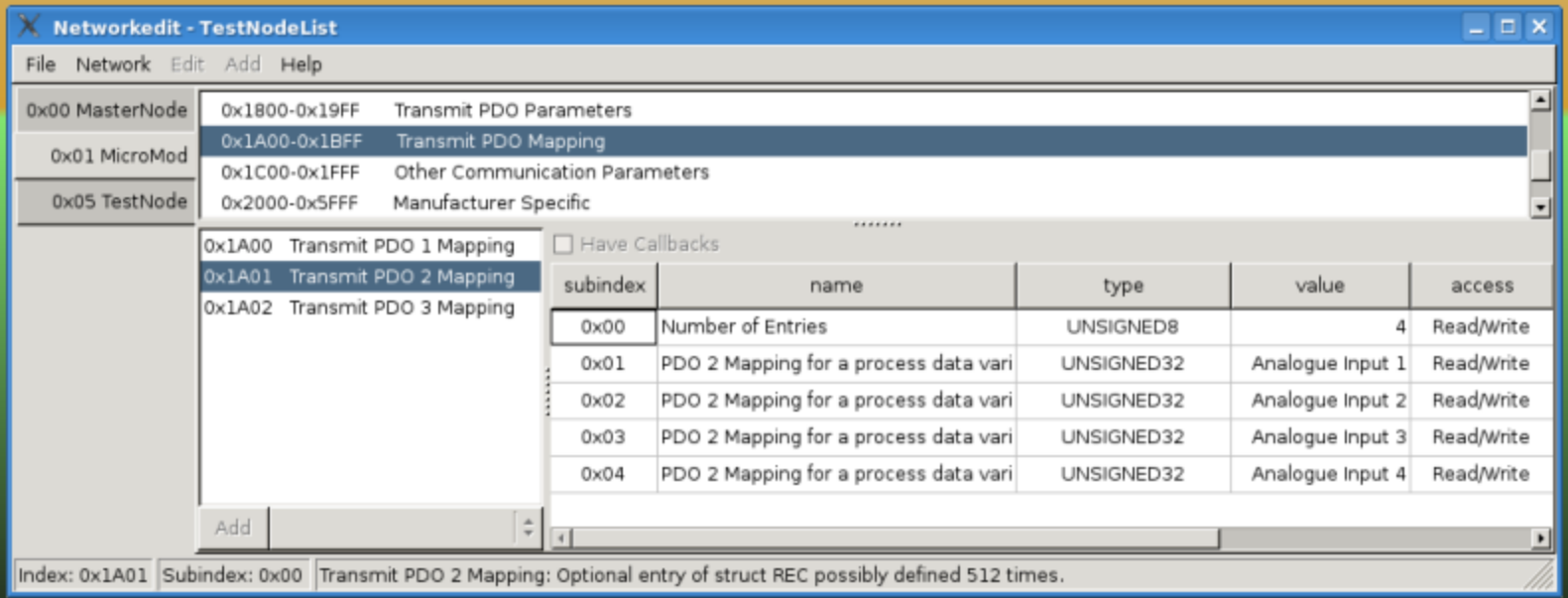
# 3. CanFestival CanOpen stack

- Started in 2001 by Edouard TISSERANT
- Runs on any target, with or without OS, fully ANSI-C
- For Beremiz, CanFestival provides :
  - A point & click GUI for CANOpen I/O
  - An I/O library
  - A HAL library

| User code | SoftPLC | IEC std lib |
|---|---|---|
| [ debug / trace code ] | | IO Lib: CanFestival |
| Target specific: CanFestival | | |

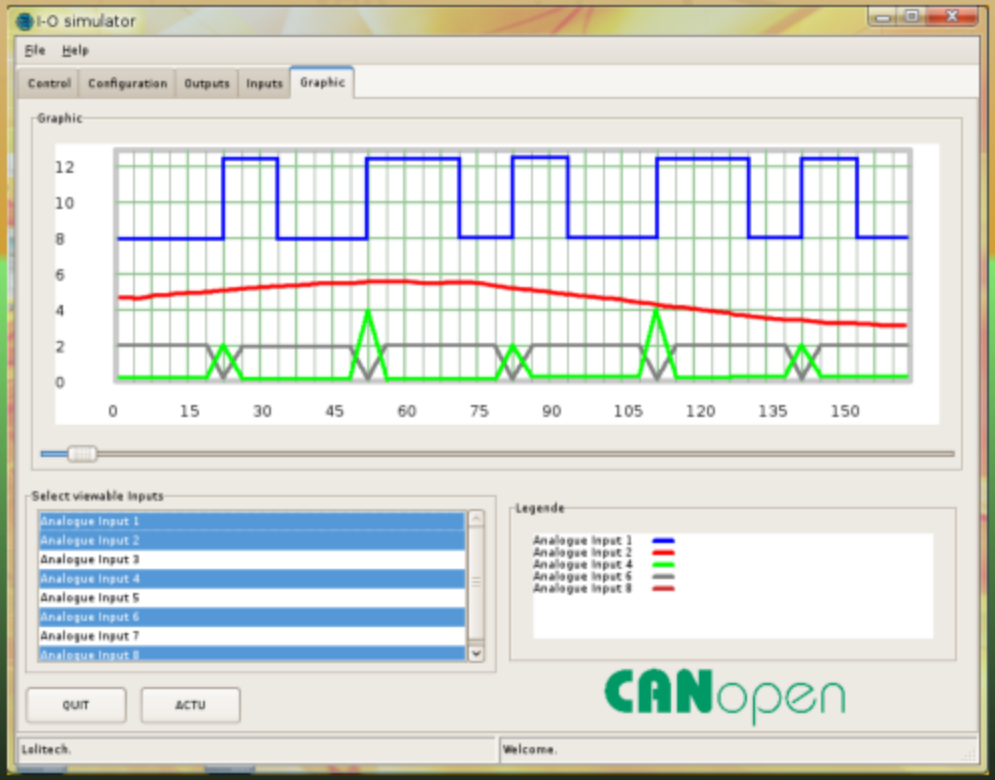
# 3. CanFestival CanOpen stack

- Network Topology Editor maps CANOpen process variables to IEC Located Variables with simple drag & drop
- User just provides vendor EDS file for each node

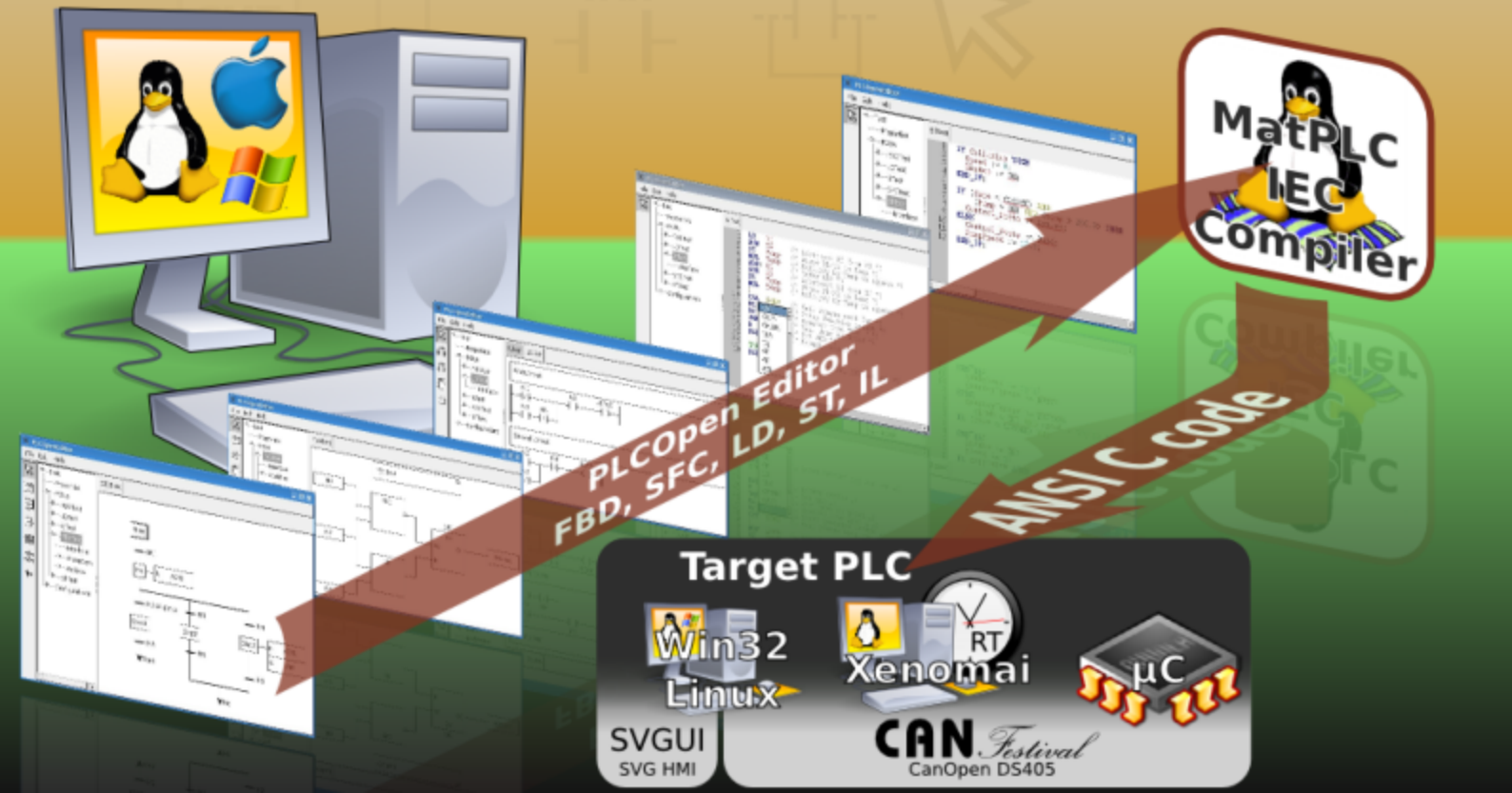


# 3. CanFestival CanOpen stack

- CanFestival's virtual IO block GUI lets users simulate and stimulate SoftPLC without any specific hardware

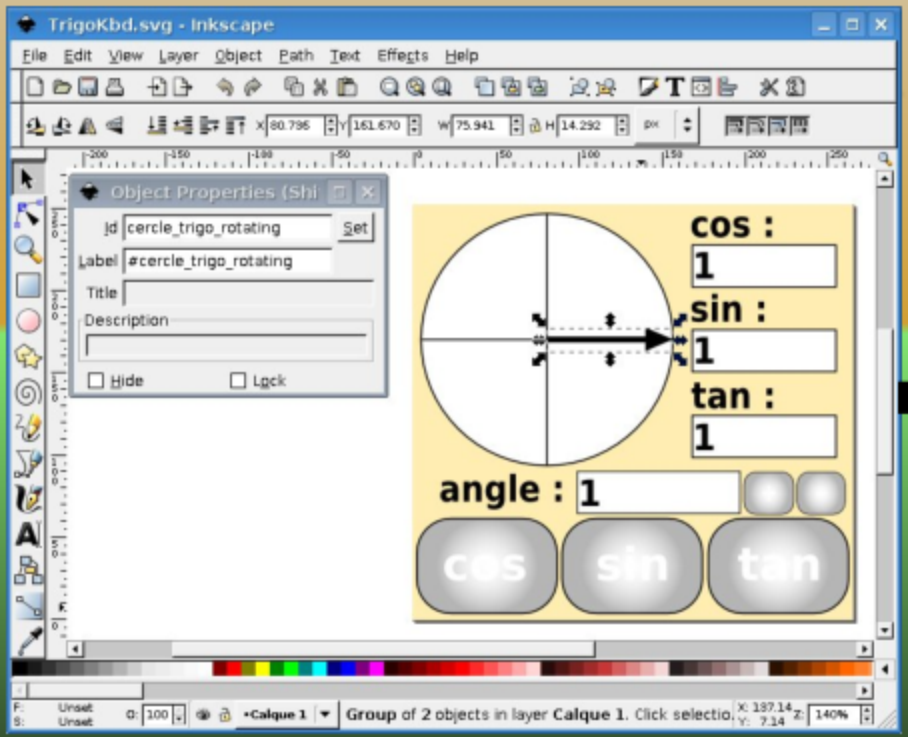


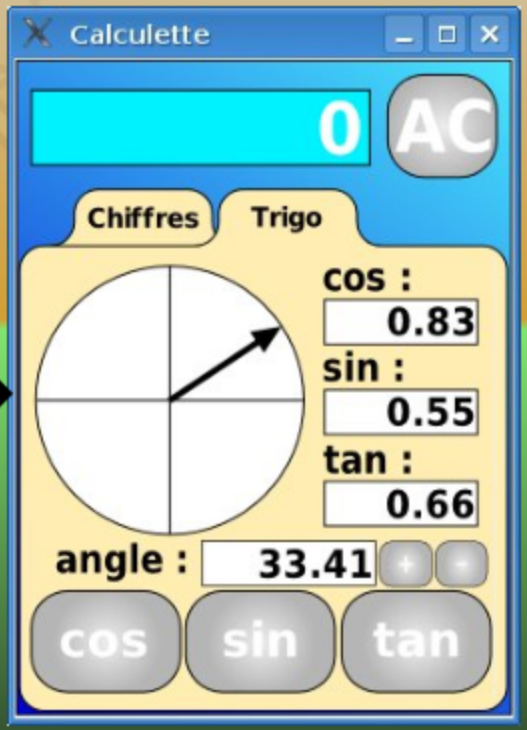
# 4. SVGUI : The SVG HMI toolkit



# 4. SVGUI : The SVG HMI toolkit

- SVGUI lets user “draw” and “skin” GUIs

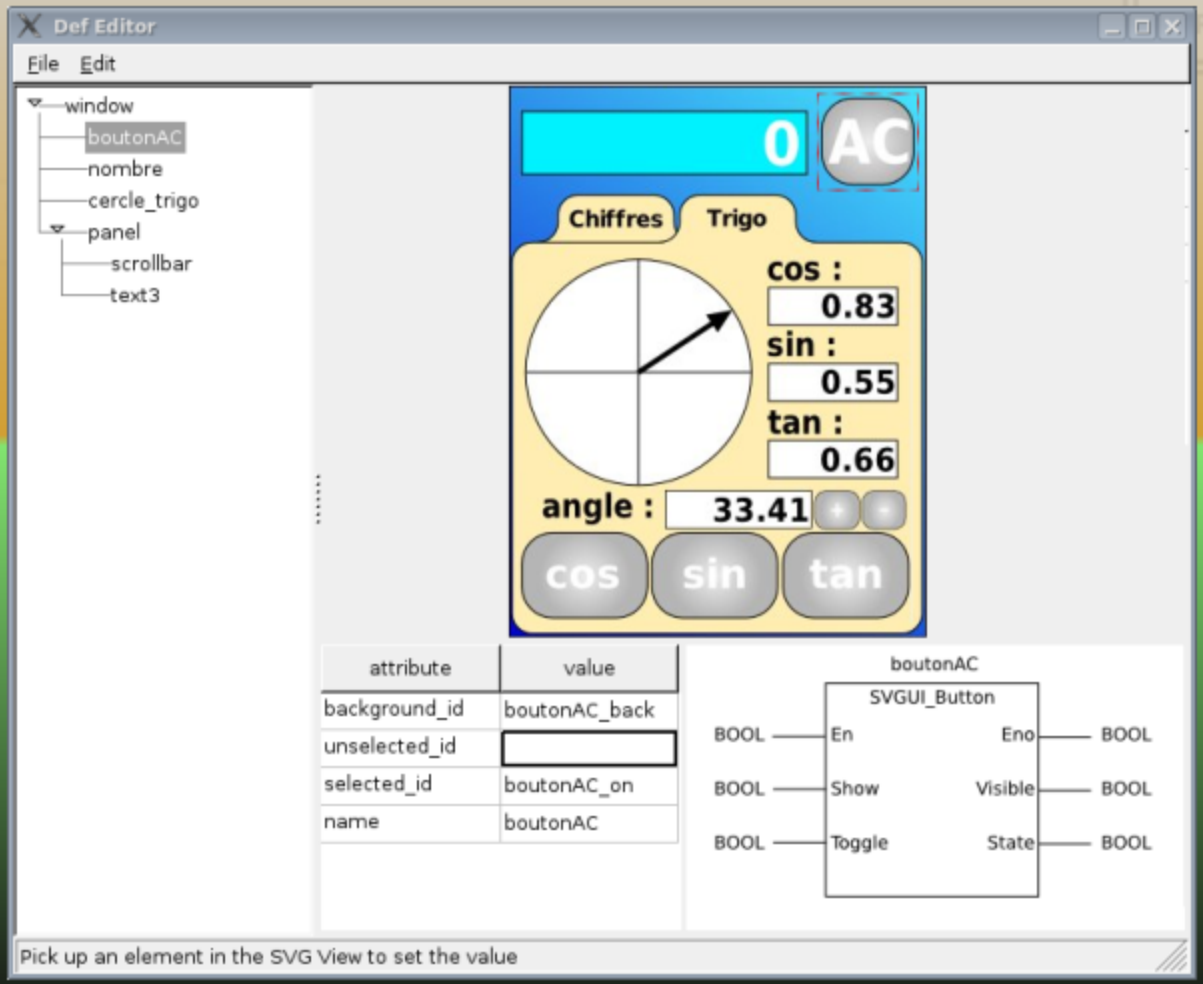



INKSCAPE
(drawing program)

HMI

# 4. SVGUI : The SVG HMI toolkit



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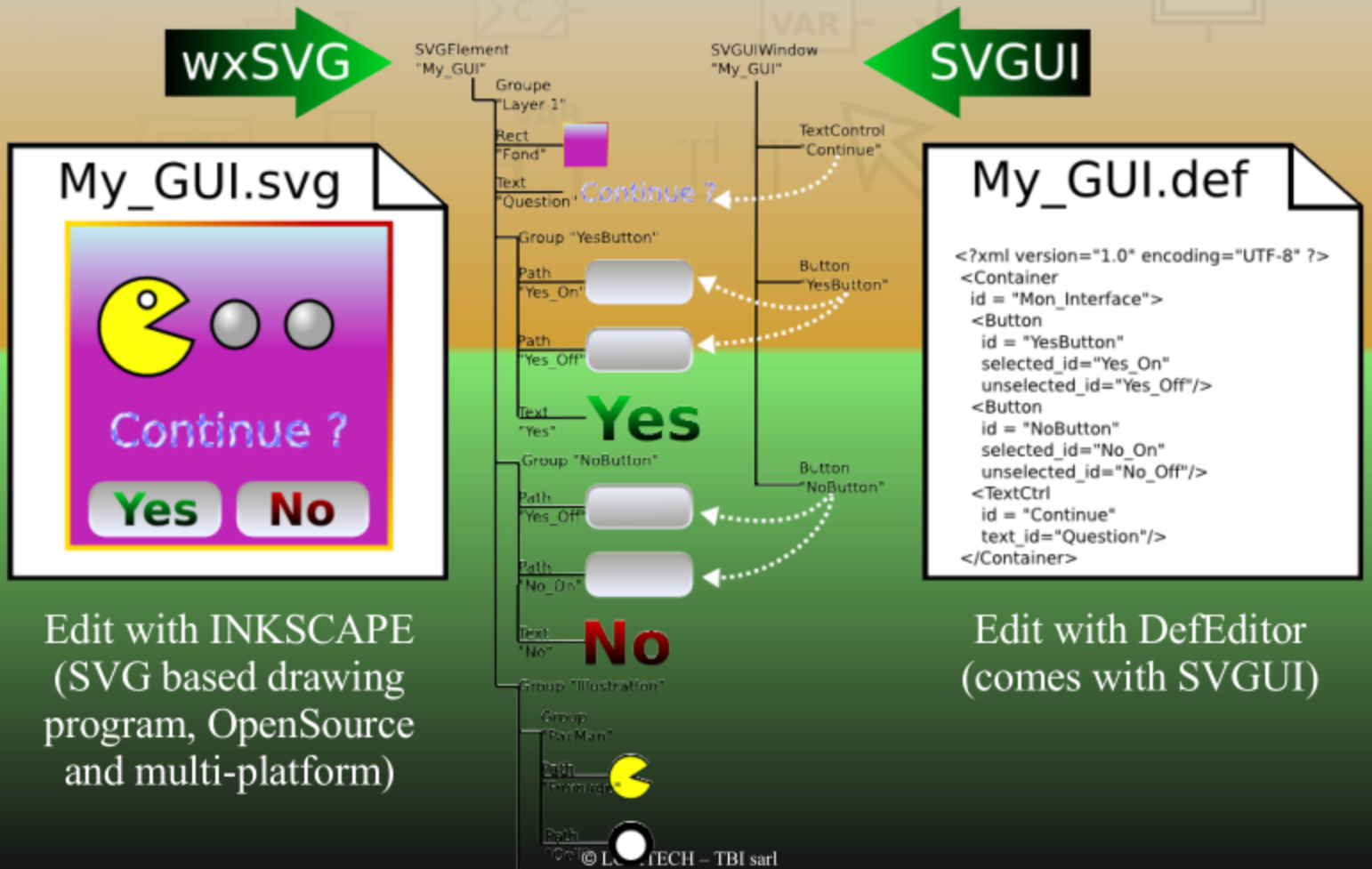

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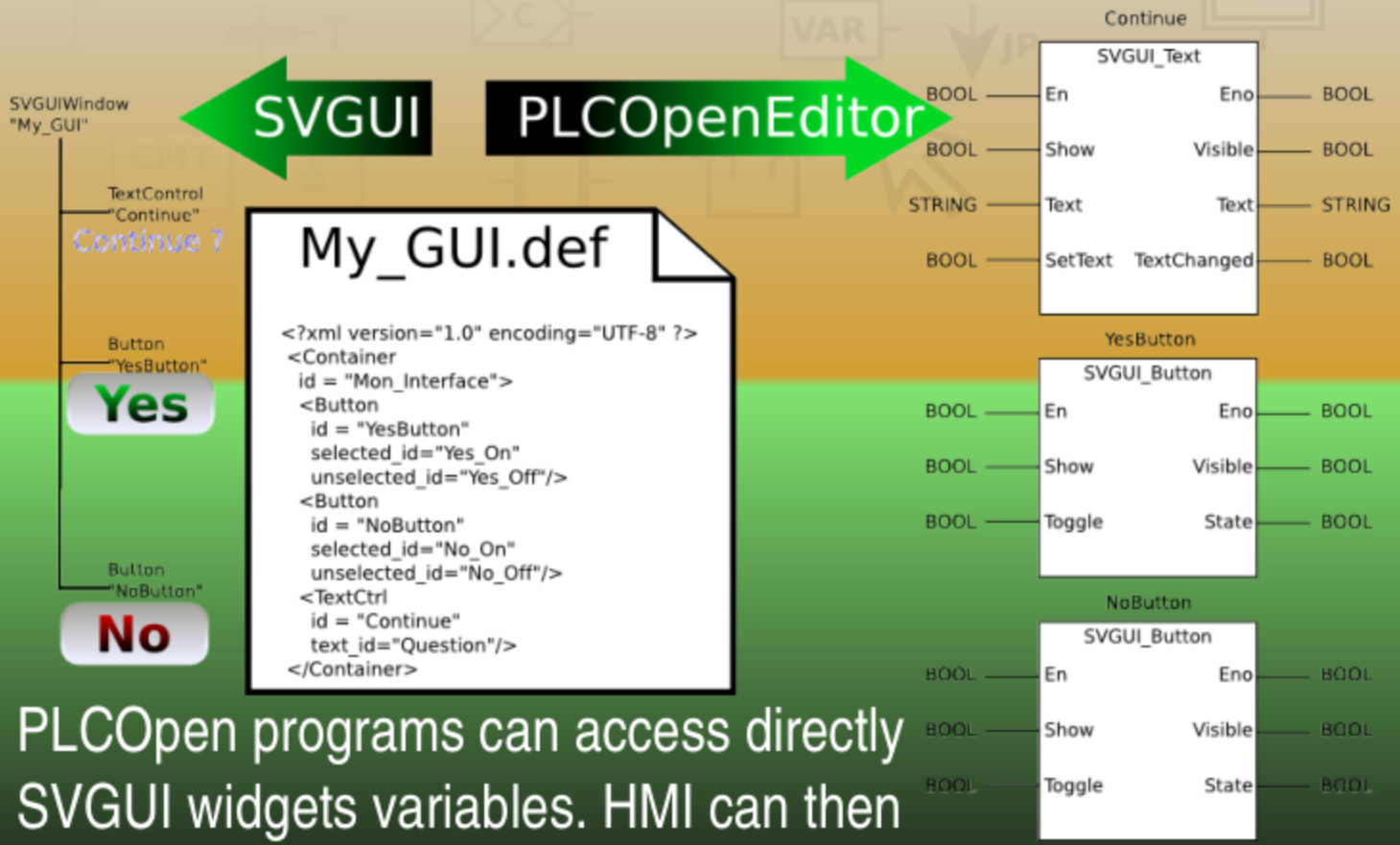


- PLCOpen programs can access directly SVGUI widgets variables. HMI can then be programmed with no code at all.

# What next ?

- Thanks to Open Standards, Beremiz will bring automation to everyone's use
- Control engineer, researchers and hobbyists will share automation the same way free software community shares source code. Public repositories will appear
- Beremiz will be used for teaching, implying long term adoption of PLCOpen, IEC-61131, CanOpen and SVG.
- Automation “vendor lock-in” will be a user choice

# Current project status

- On the road to stability :
  - PLCOpenEditor , IEC to C and SVGUI's are experimental, they prove the concept, but need improvements
  - 2.5 man-years needed to provide a production release

- Time to join and contribute :
  - Source is available on public CVS
  - Sponsoring, donation, patronage or funding are needed
  - Shared automation repositories need your blocks

# Behind the project

LOLITech
Logiciel Libre et Technologie

- Lolitech is a French company, held in 2005
- Our business model is based on Free Software
- Our goal is to bring Free Software to Industry
- We provide early support for the project, and manage community contributions
- Once official, the Beremiz foundation will drive, finance and represent the project

www.beremiz.org

# Beremiz

Open Source Software for Automation