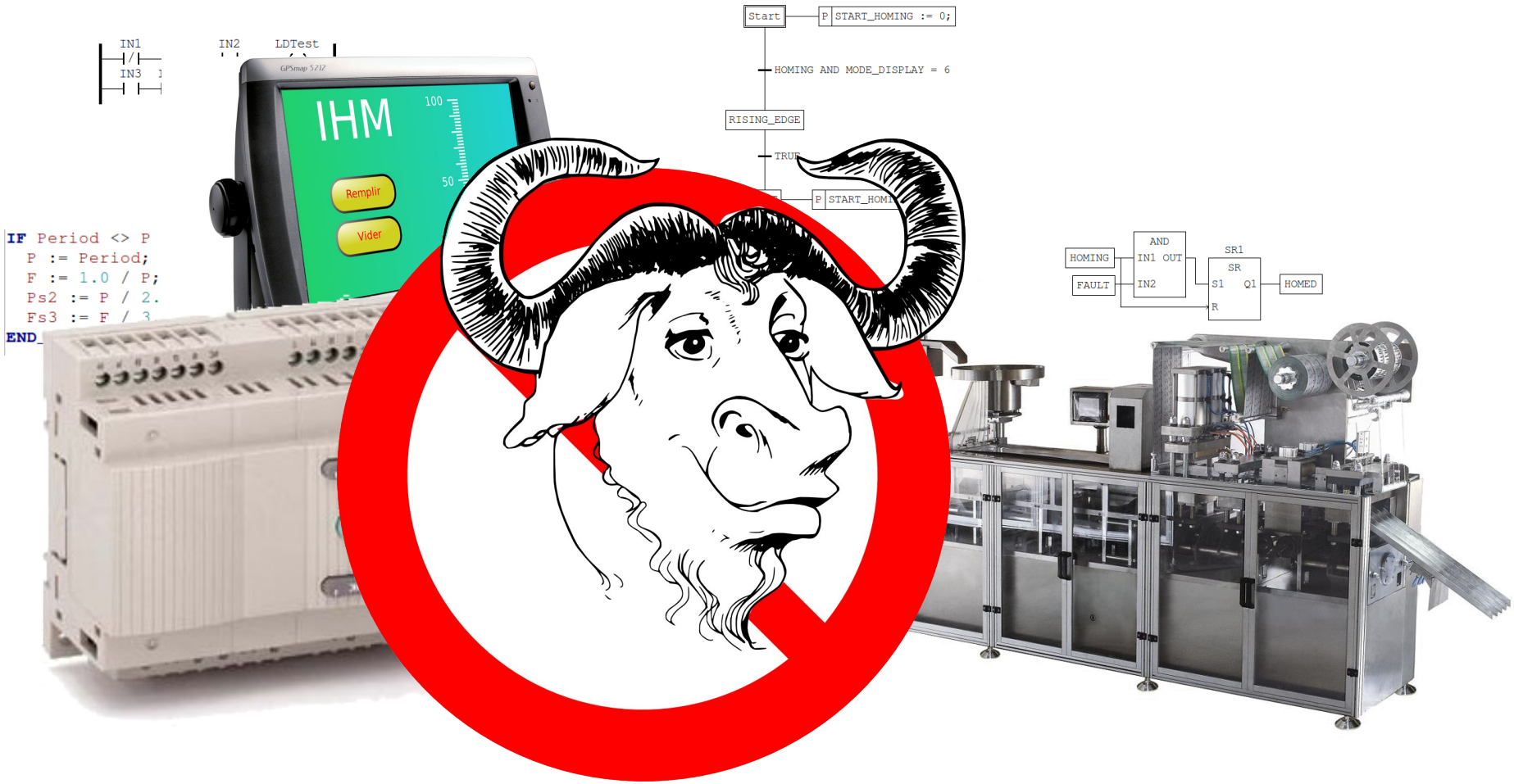
Roadmap
from
CanFestival and MatPLC
to
Automforge.net.

PLC programs
Free Software outcasts ?



Why ?

I'm a PLC

Different focus

Different knowledge sharing culture

No Free (Beer) Machine

Open Standards

PLCopen XML
EXTENSIBLE <MARKUP> LANGUAGE

ISO
IEC
61131
61499
...

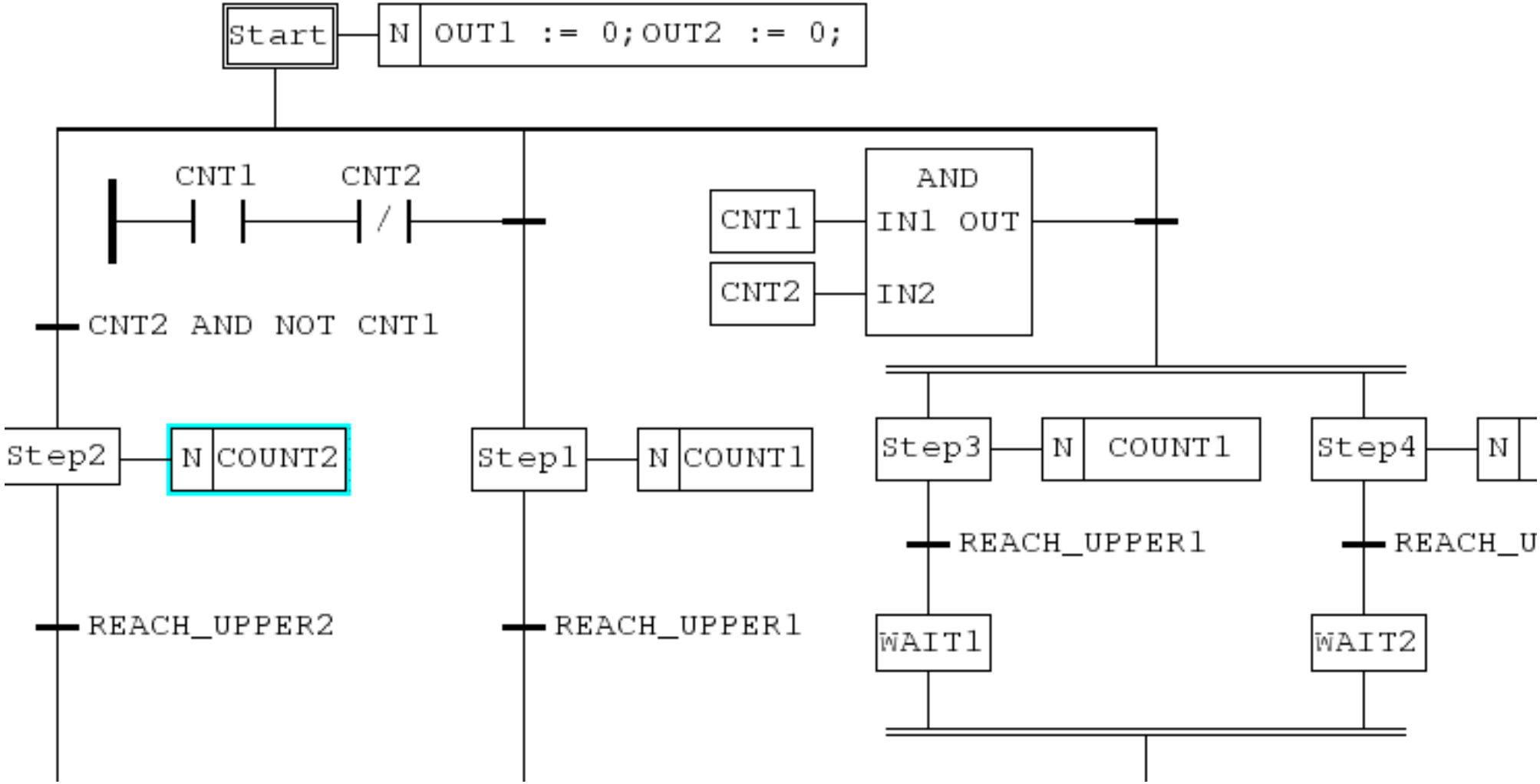
Modbus

CANopen

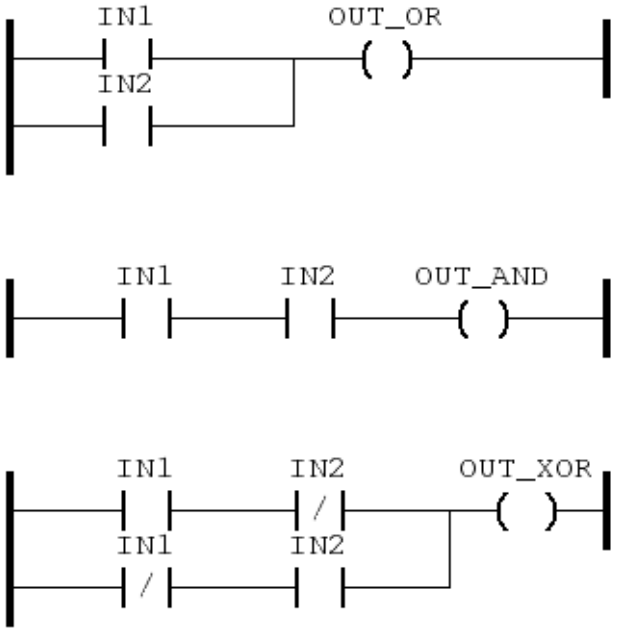
ETHERNET POWERLINK

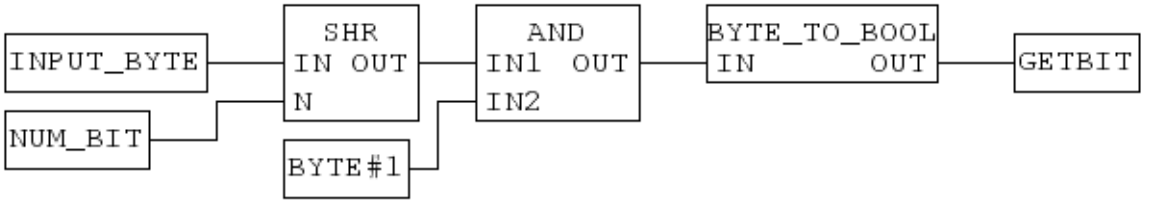
...

IEC-61131-3 (SFC)



IEC-61131-3 (LD, FBD)





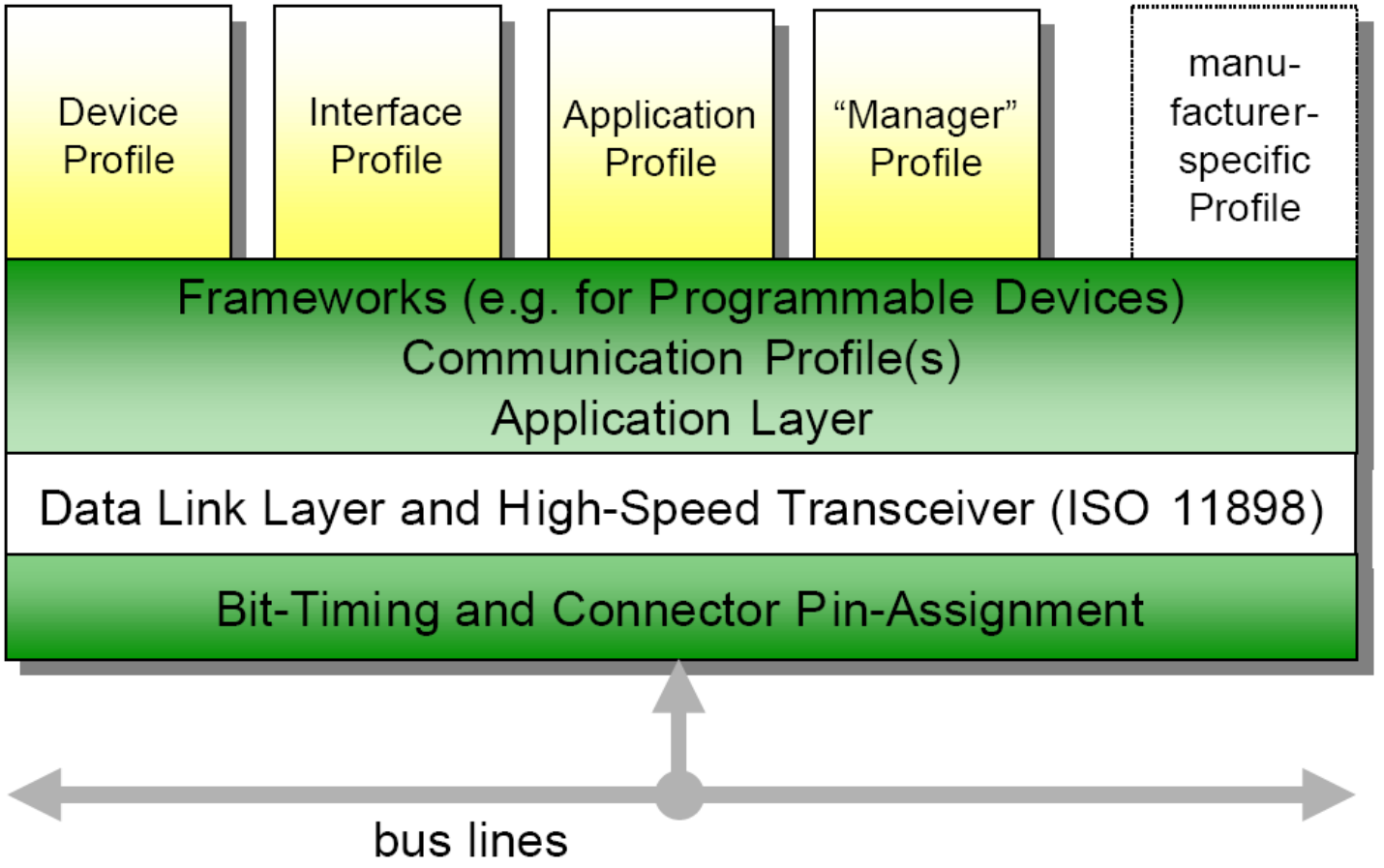
IEC-61131-3 (ST, IL)

```
 1  IF Collision THEN
 2    Speed := 0;
 3    Brakes := ON;
 4  END_IF;
 5
 6  IF (Gate = CLOSED) AND
 7      (Pump = ON) AND (Temp > 200.0) THEN
 8    Control_State := Active;
 9  ELSE
10    Control_State := Hold;
11    PumpSpeed := 10.0;
12  END_IF;
```

```
 2      LD    Y1
 3      SUB   Y2      (* Substract Y2 from Y1 *)
 4      ST    Temp    (* Store Y1-Y2 in Temp *)
 5      MUL   Temp    (* Multiply by Temp to square *)
 6      ADD(  X1      (* Defer ADD *)
 7      SUB   X2      (* Substract X1 from X2 *)
 8      ST    Temp    (* Store X1-X2 in Temp *)
 9      MUL   Temp    (* Multiply by Temp to square *)
10      )
11      SQRT          (* Call Square root fun *)
12      ST    ILTest  (* Setup function result *)
13      GT    TMax    (* Greater than TMax ? *)
14      JMPC  ERR     (* Yes, Jump to Error *)
15      S     ERROR   (* Set ERROR *)
16      RET           (* Normal return *)
17  ERR: RET          (* Error return, ENO not set *)
```

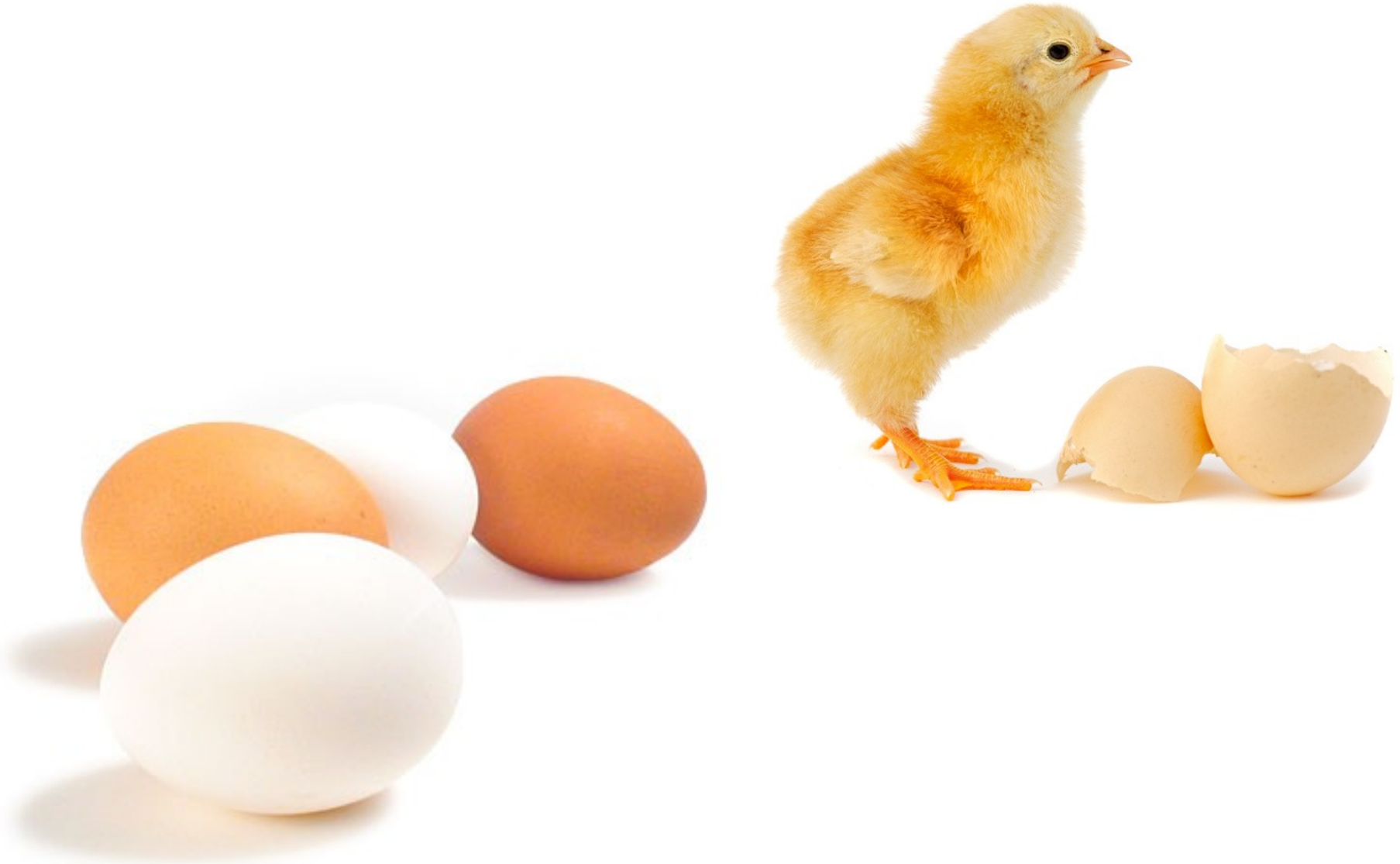
CANopen

OSI Model		
	Data unit	Layer
Host layers	Data	7. Application
		6. Presentation
		5. Session
	Segment	4. Transport
Media layers	Packet	3. Network
	Frame	2. Data Link
	Bit	1. Physical



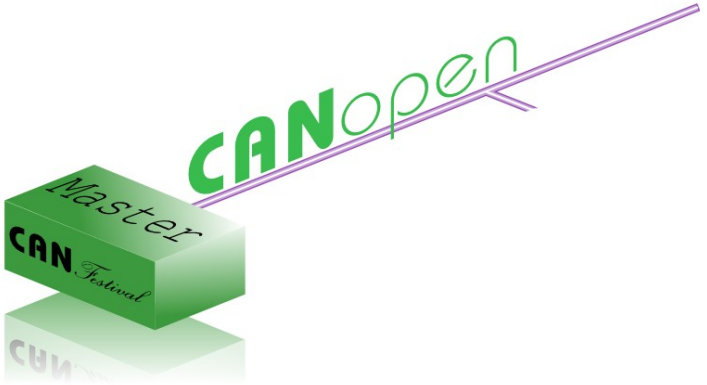
Open Standards ditch

Bootstrap Freedom



2001

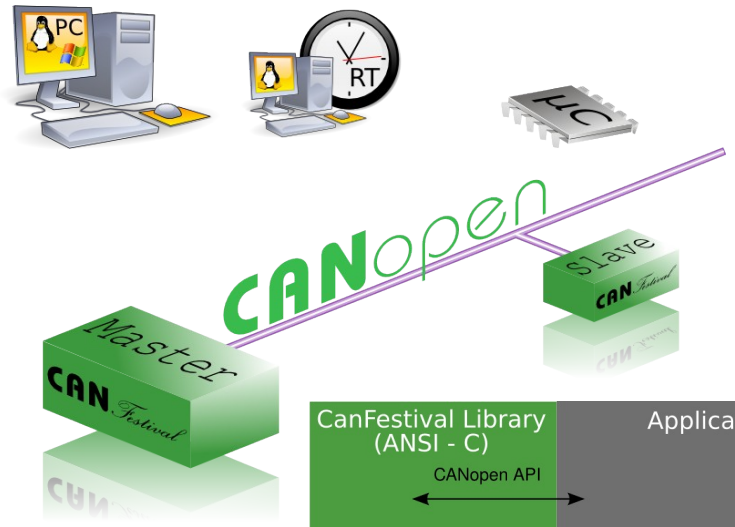
CAN Festival



MatPLC

2003

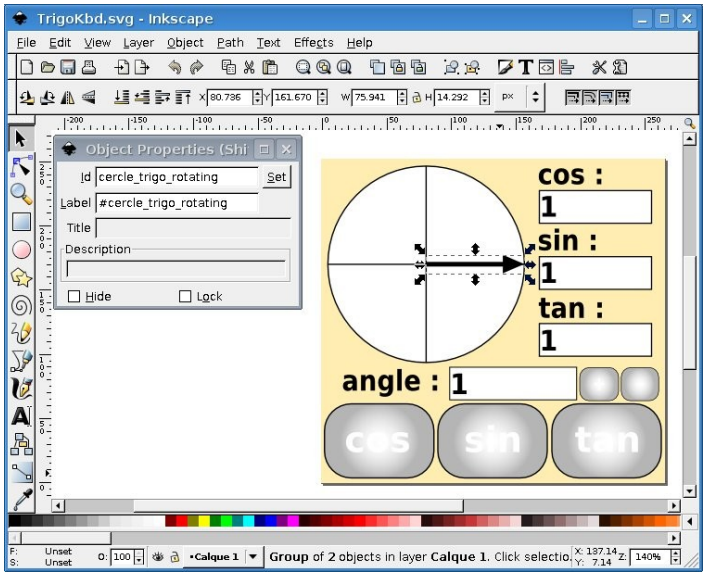
CAN Festival

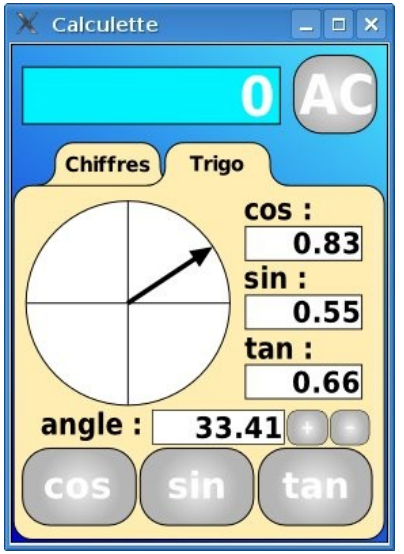


MatPLC

IEC 61131-3 → C++

2005





1) SVG UI / wxPython Cross-Platform GUI Library (http://wxPython.org/) + Inkscape

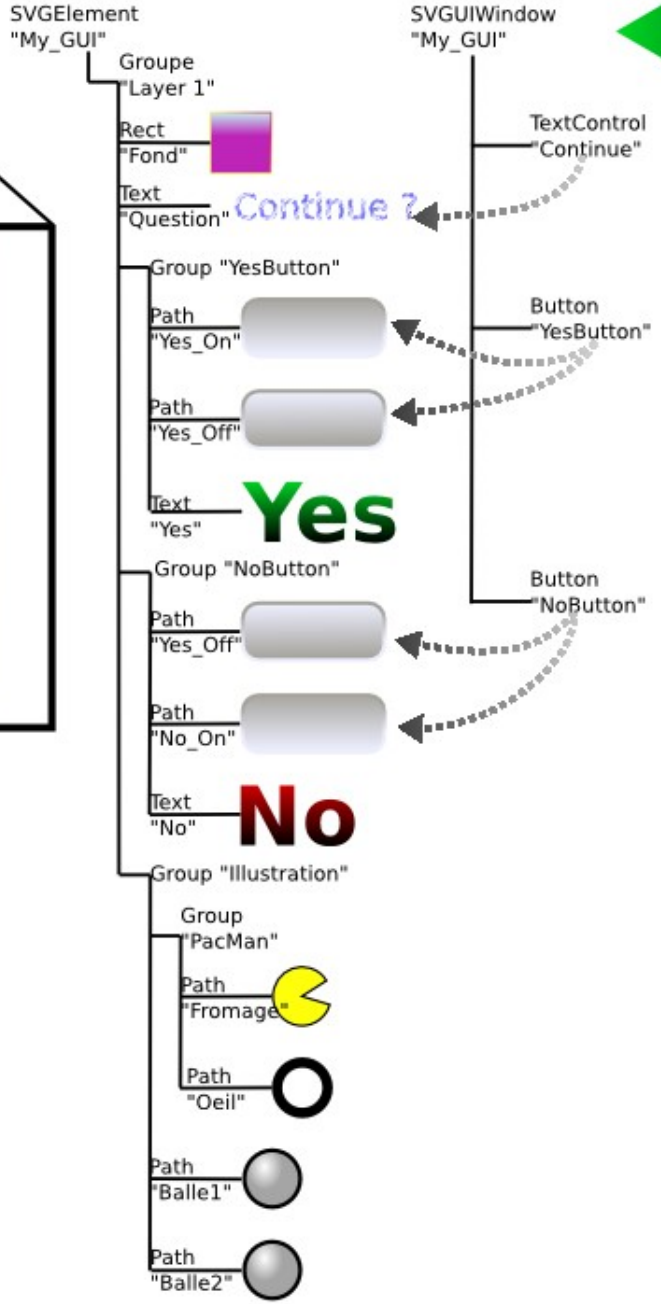
2) SVG UI / wxSVG

SVGUI

wxSVG

SVGUI

My_GUI.svg



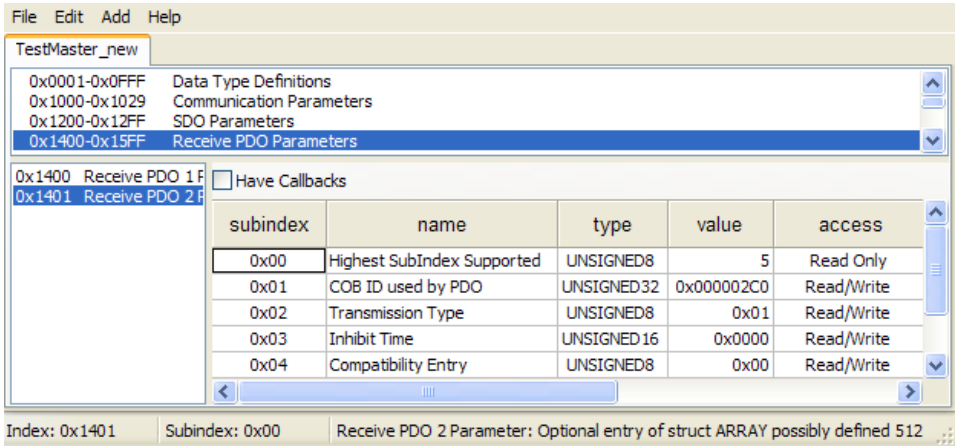
My_GUI.def

```
<?xml version="1.0" encoding="UTF-8" ?>
 <Container
  id = "Mon_Interface">
  <Button
   id = "YesButton"
   selected_id="Yes_On"
   unselected_id="Yes_Off"/>
  <Button
   id = "NoButton"
   selected_id="No_On"
   unselected_id="No_Off"/>
  <TextCtrl
   id = "Continue"
   text_id="Question"/>
 </Container>
```

2005

2006

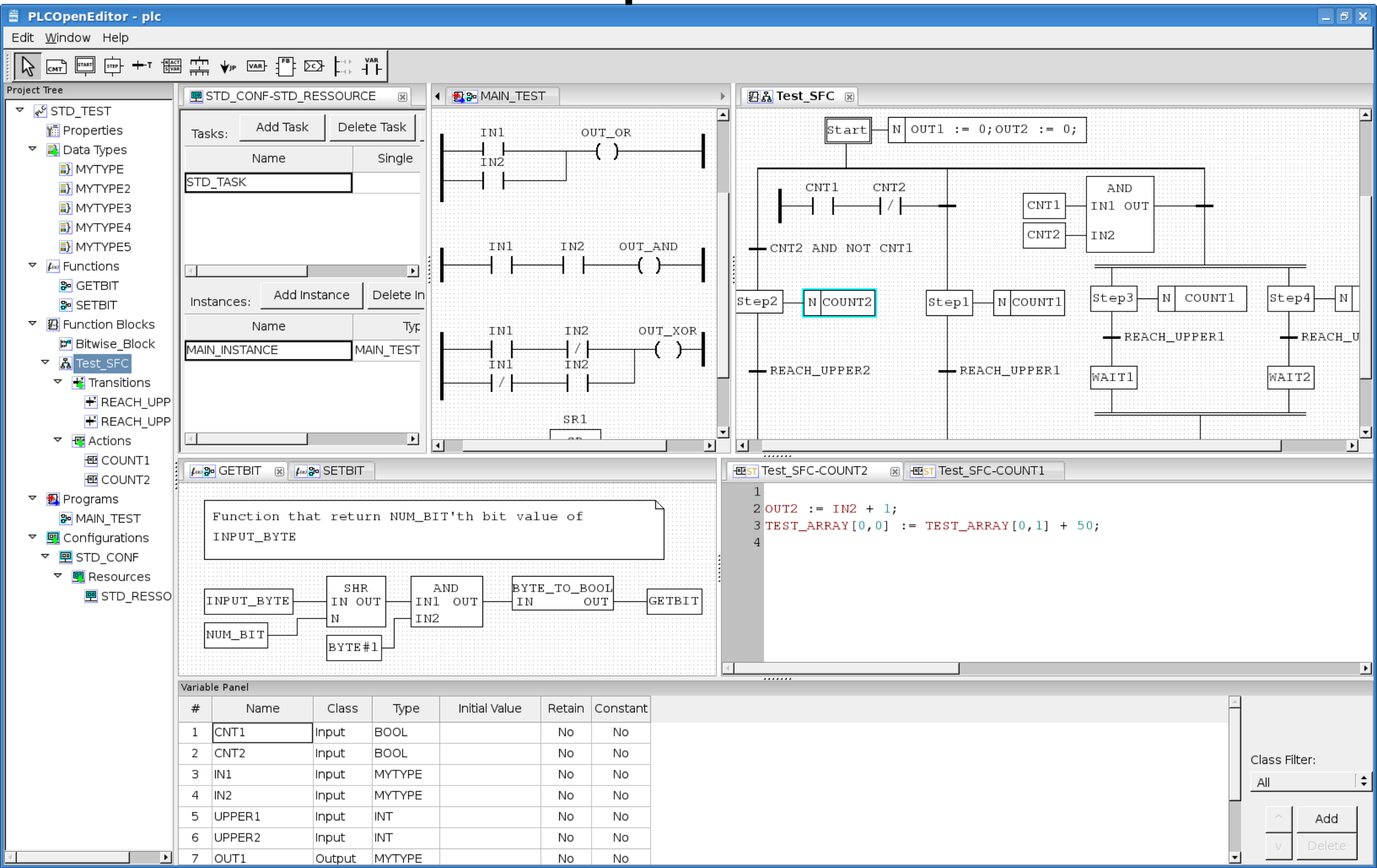
CAN Festival



Object Dictionary Editor

PLCopen XML EXTENSIBLE <MARKUP> LANGUAGE + python →

PLCopenEditor



2007

Beremiz

Free Software for Automation

IEC 61131-3 ➔ C++

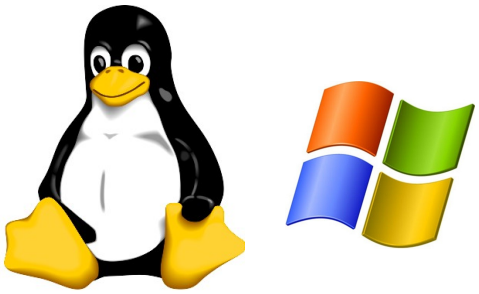
ST, IL ➔ C++

➔

IEC 61131-3 ➔ C

ST, IL, SFC ➔ C

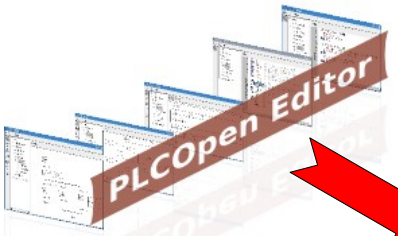
2007



Plugin based
PLC project
management

2007

Beremiz IEC-61131 Toolchain



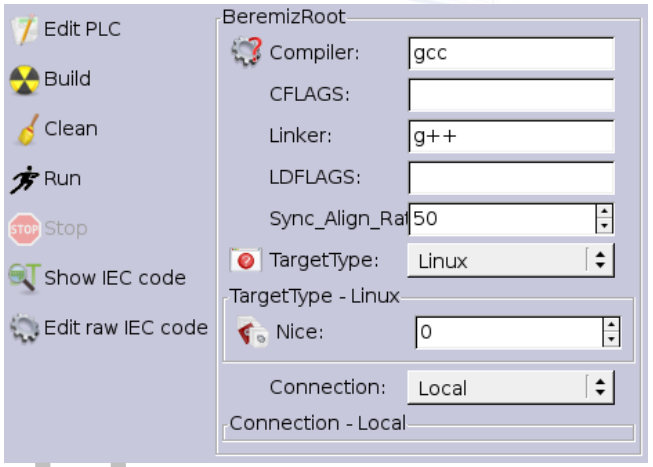
IEC-61131-3 Textual Languages (ST, IL, SFC)

MatIEC IEC to C Compiler

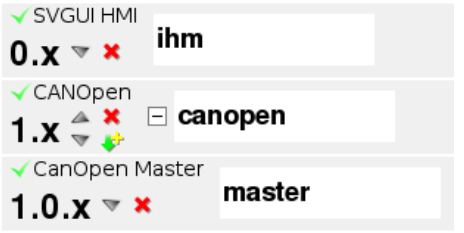
ANSI-C code

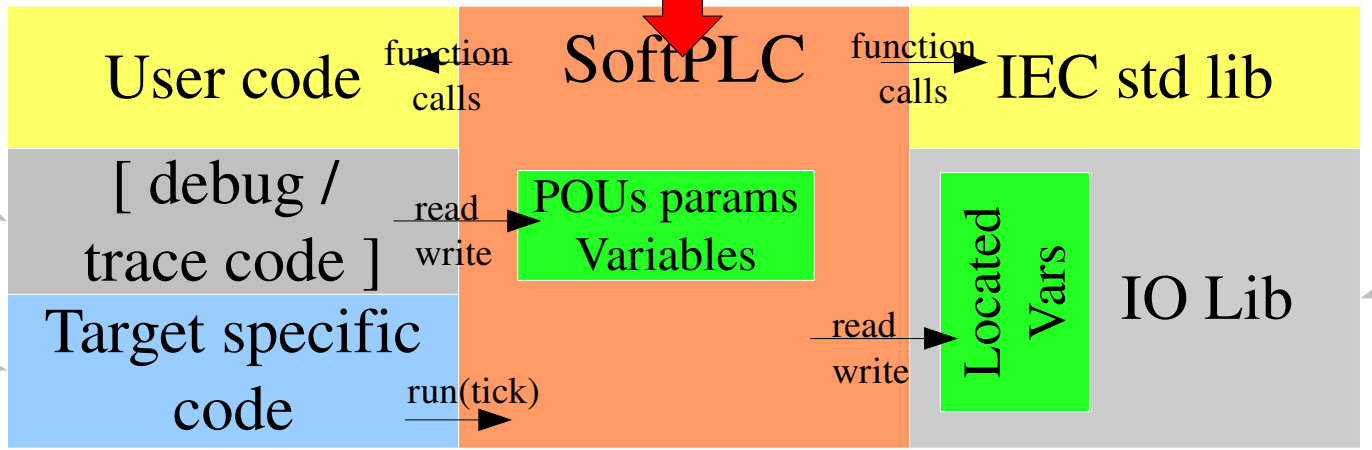
C compiler

Target PLC configuration



Plugins

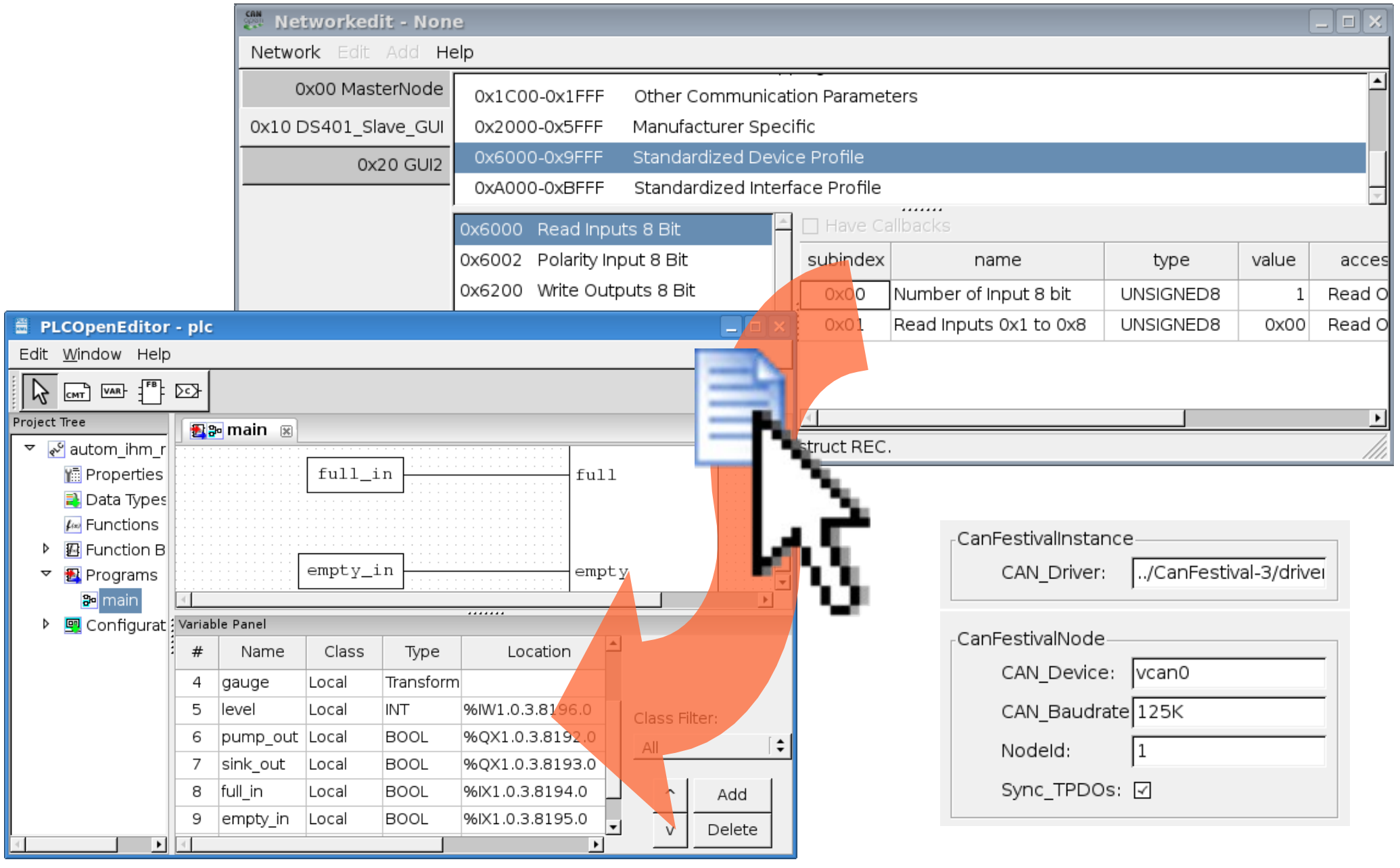




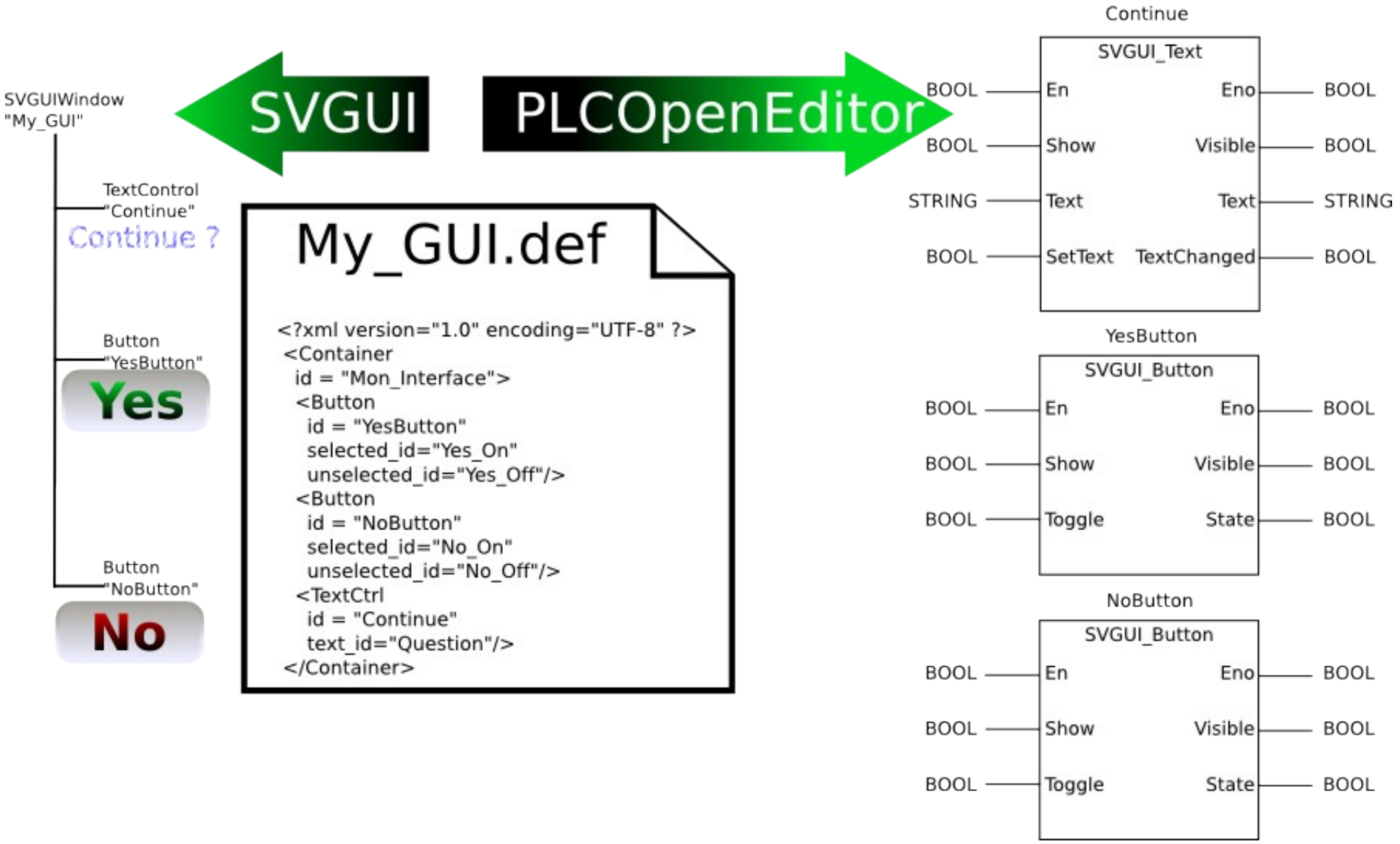
2008

- CAN Festival
- SVG UI / wxSVG
- Generic C plugin

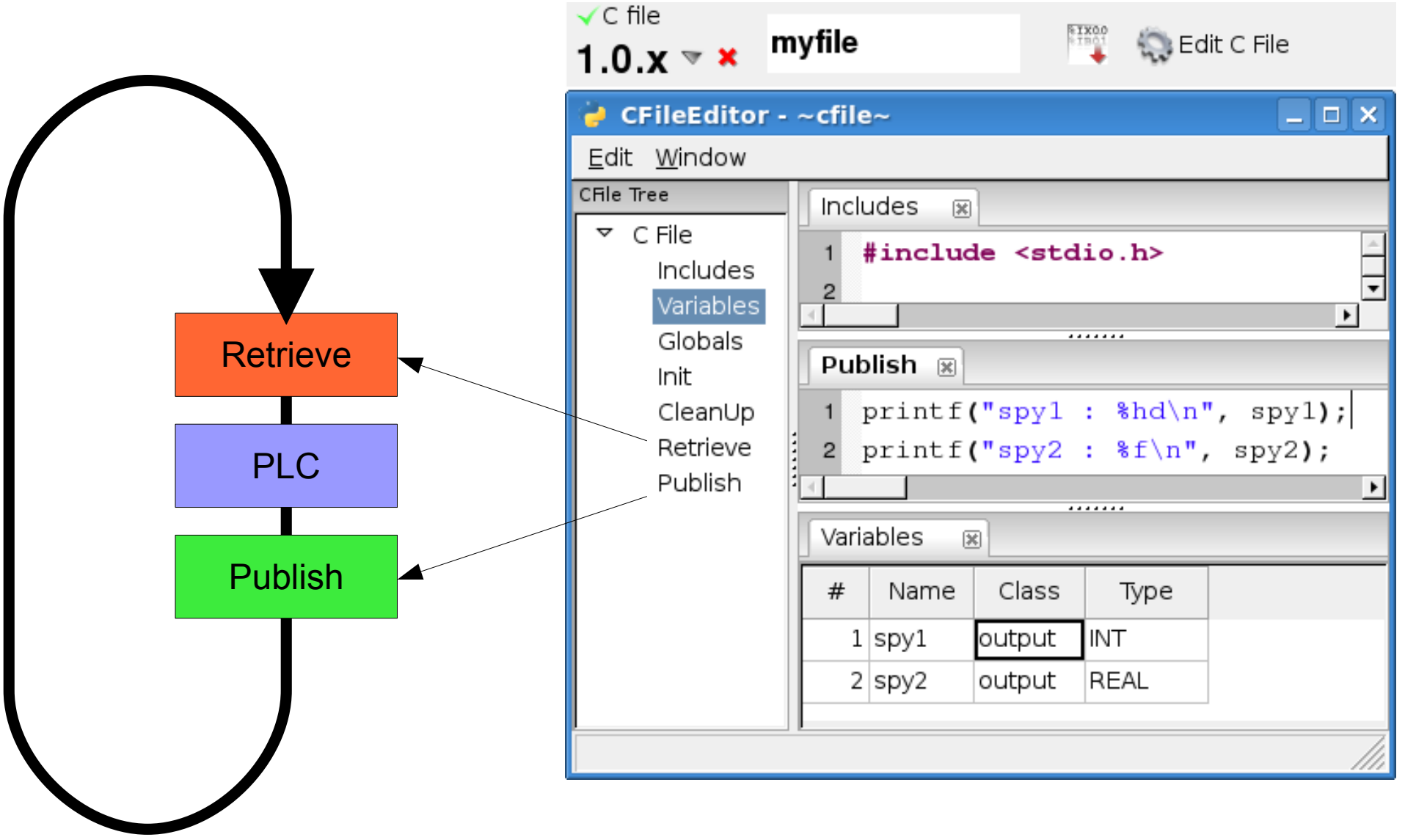
2008


Networkedit - None
Network Edit Add Help
0x00 MasterNode
0x10 DS401_Slave_GUI
0x20 GUI2
0x1C00-0x1FFF Other Communication Parameters
0x2000-0x5FFF Manufacturer Specific
0x6000-0x9FFF Standardized Device Profile
0xA000-0xBFFF Standardized Interface Profile
0x6000 Read Inputs 8 Bit
0x6002 Polarity Input 8 Bit
0x6200 Write Outputs 8 Bit
Have Callbacks
subindex name type value acces
0x00 Number of Input 8 bit UNSIGNED8 1 Read O
0x01 Read Inputs 0x1 to 0x8 UNSIGNED8 0x00 Read O
struct REC.
PLCOpenEditor - plc
Edit Window Help
Project Tree
autom_ihm_r
Properties
Data Types
Functions
Function B
Programs
main
Configurat
main
full_in
full
empty_in
empty
Variable Panel
Name Class Type Location
4 gauge Local Transform
5 level Local INT %IW1.0.3.8196.0
6 pump_out Local BOOL %QX1.0.3.8192.0
7 sink_out Local BOOL %QX1.0.3.8193.0
8 full_in Local BOOL %IX1.0.3.8194.0
9 empty_in Local BOOL %IX1.0.3.8195.0
Class Filter:
All
Add
Delete
CanFestivalInstance
CAN_Driver: ../CanFestival-3/driver
CanFestivalNode
CAN_Device: vcan0
CAN_Baudrate 125K
NodeId: 1
Sync_TPDOs:

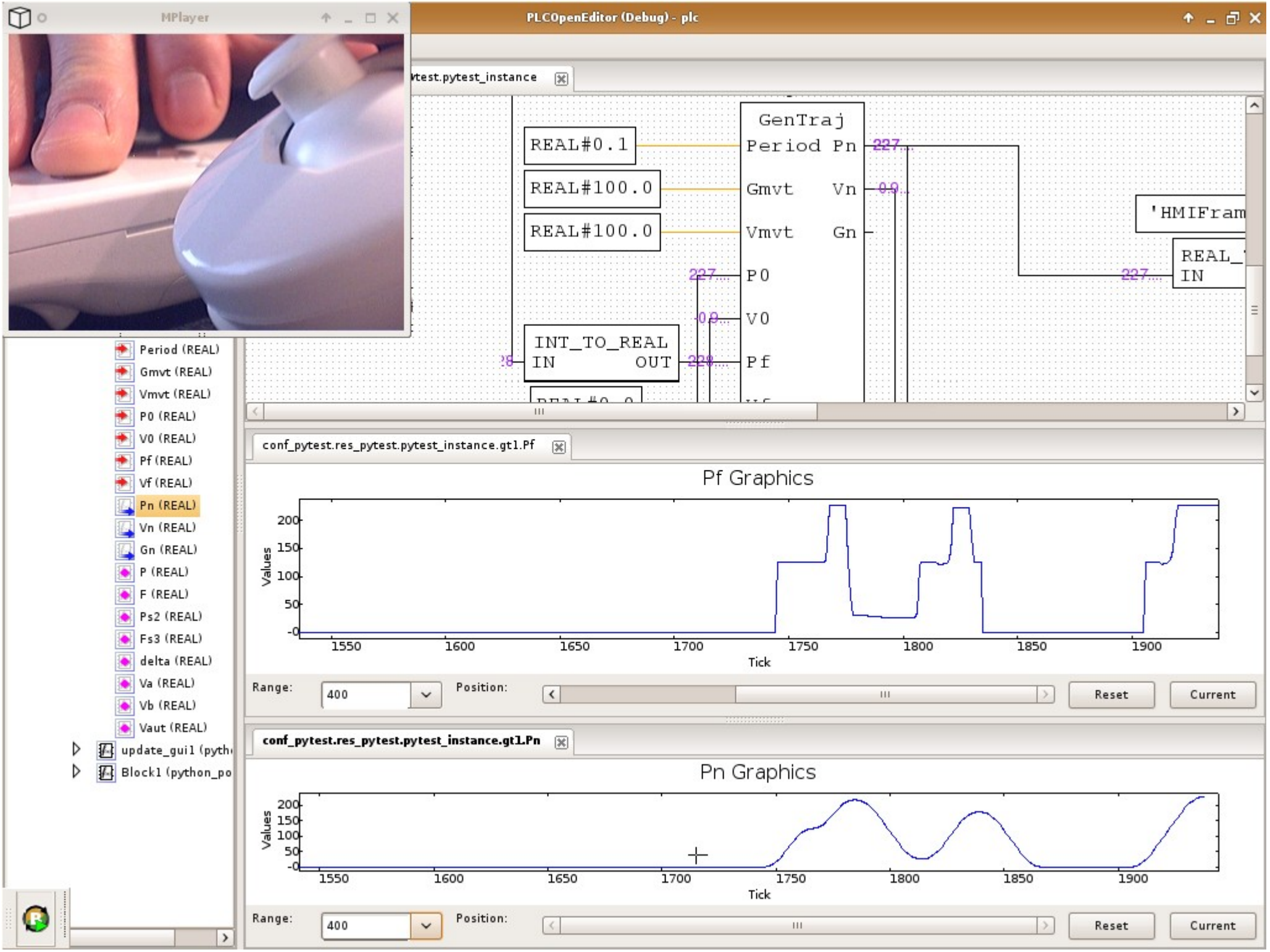
SVGUI plugin



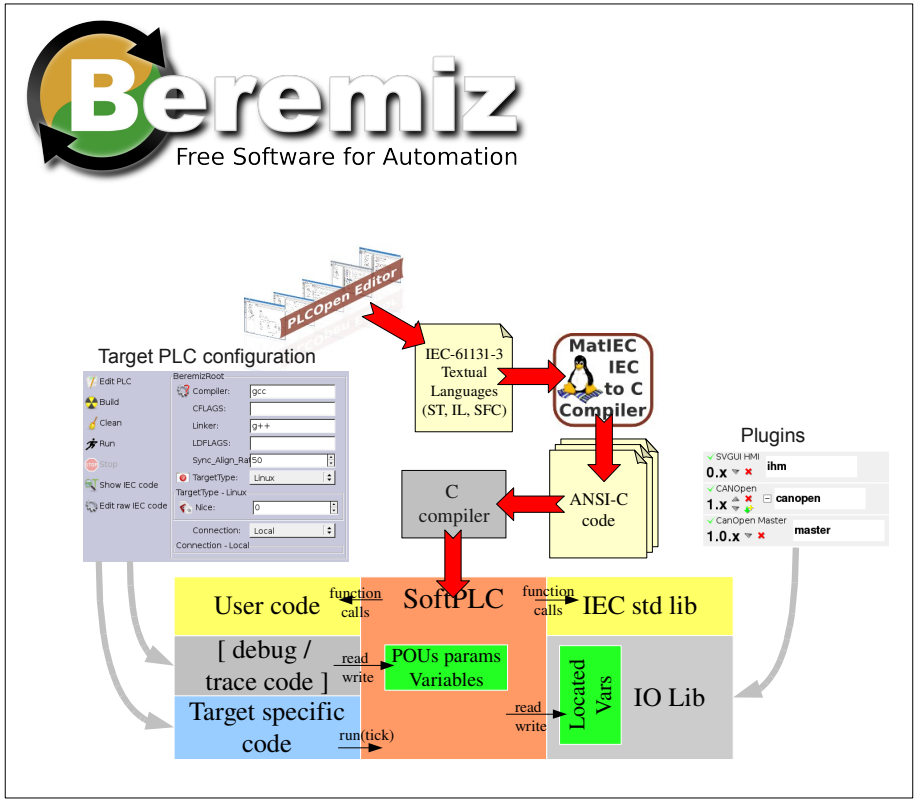
C plugin


Retrieve
PLC
Publish
C file
1.0.x
myfile
Edit C File
CFileEditor - ~cfile~
Edit
Window
CFile Tree
C File
Includes
Variables
Globals
Init
CleanUp
Retrieve
Publish
Includes
1 #include <stdio.h>
2
Publish
1 printf("spy1 : %hd\n", spy1);
2 printf("spy2 : %f\n", spy2);
Variables
Name Class Type
1 spy1 output INT
2 spy2 output REAL

2008

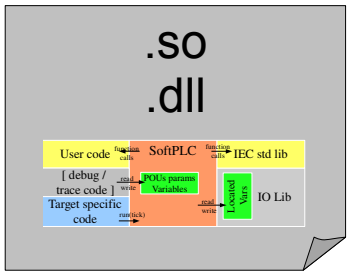

MPlayer
PLCOpenEditor (Debug) - plc
ytest.pytest_instance
GenTraj
REAL#0.1
Period Pn
REAL#100.0
Gmvt Vn
REAL#100.0
Vmvt Gn
P0
V0
INT_TO_REAL
IN OUT
Pf
'HMIFram
REAL_
IN
Period (REAL)
Gmvt (REAL)
Vmvt (REAL)
P0 (REAL)
V0 (REAL)
Pf (REAL)
Vf (REAL)
Pn (REAL)
Vn (REAL)
Gn (REAL)
P (REAL)
F (REAL)
Ps2 (REAL)
Fs3 (REAL)
delta (REAL)
Va (REAL)
Vb (REAL)
Vaut (REAL)
update_gui1 (pyth
Block1 (python_po
conf_pytest.res_pytest.pytest_instance.gt1.Pf
Pf Graphics
Values
Tick
Range:
400
Position:
Reset
Current
conf_pytest.res_pytest.pytest_instance.gt1.Pn
Pn Graphics
Values
Tick
Range:
400
Position:
Reset
Current

2008



“runtime”

beremiz_service.py



python

python

PyRO, ZeroConf

2009


Beremiz
Free Software for Automation

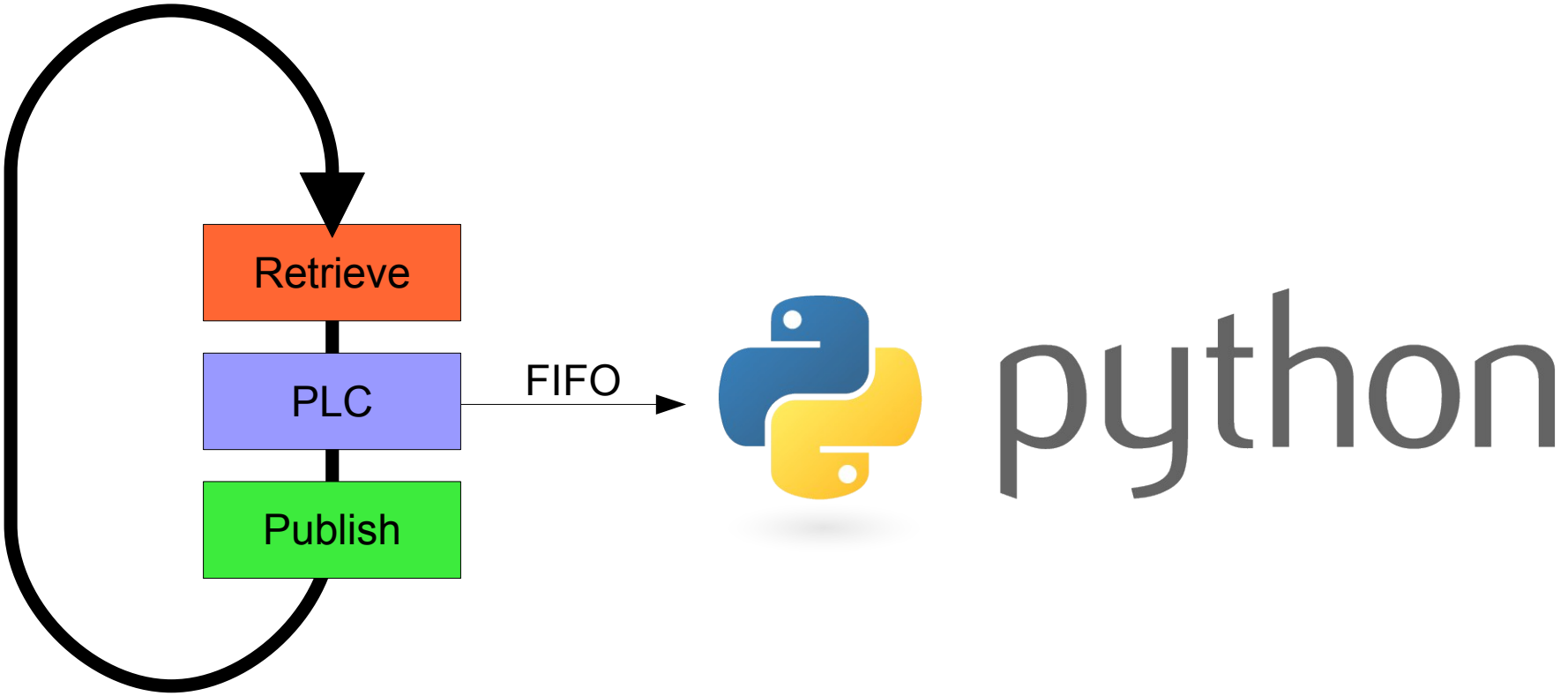

python


wxGlade
a GUI builder for wxWidgets

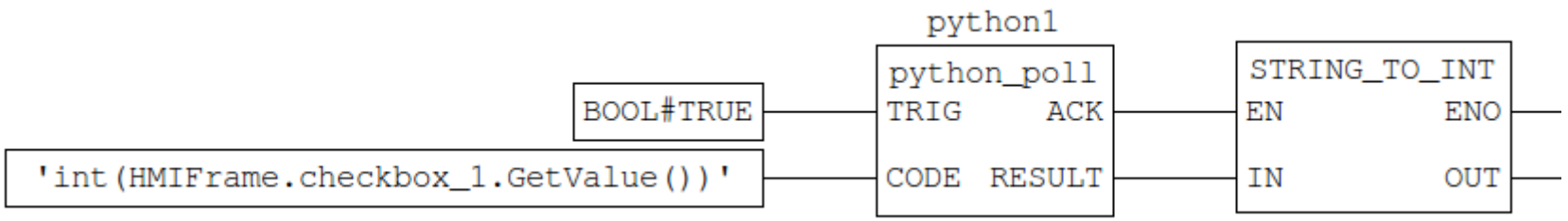

SVG UI

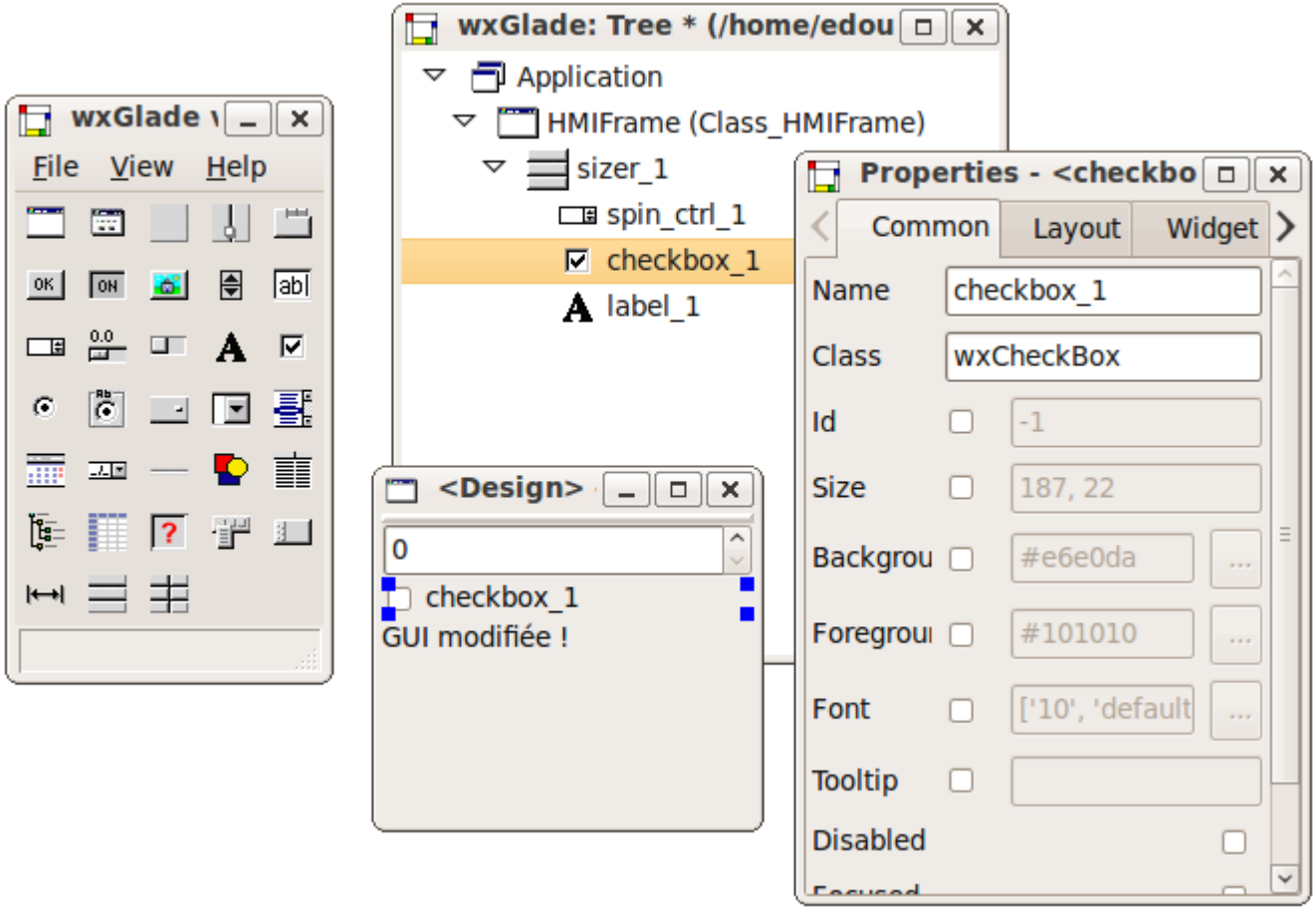
/

Python Plugin

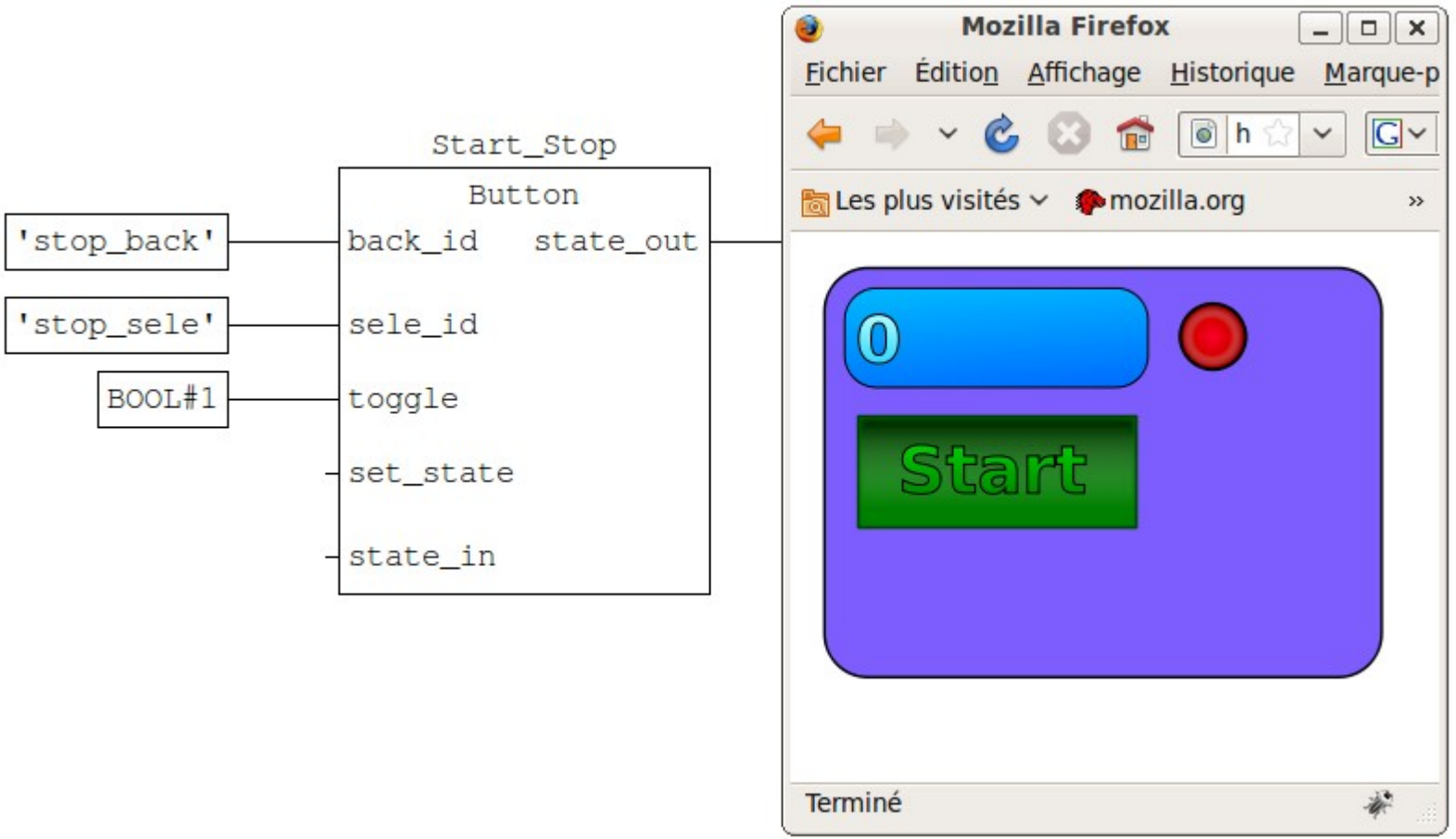


WxGlade Plugin



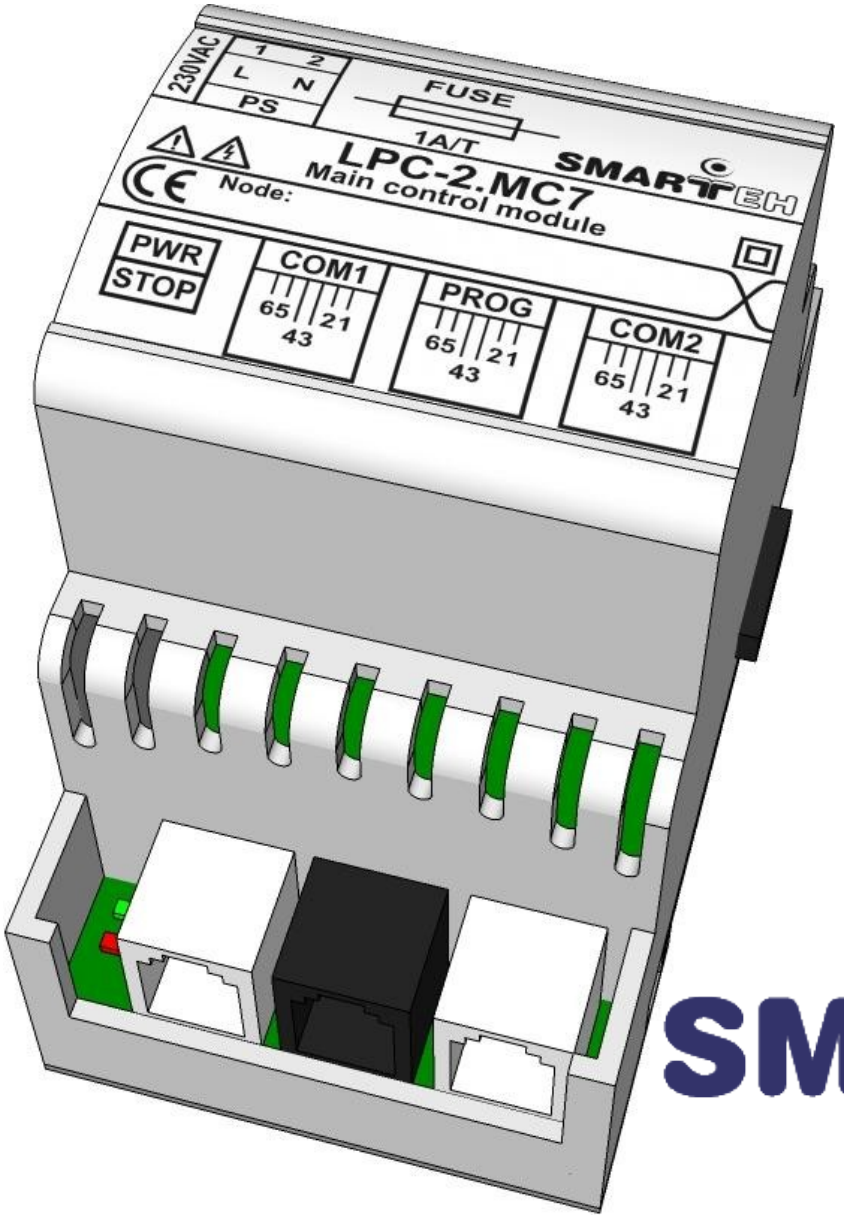


SVGUI / web


Start_Stop
Button
'stop_back'
back_id
state_out
'stop_sele'
sele_id
BOOL#1
toggle
set_state
state_in
Mozilla Firefox
Fichier
Édition
Affichage
Historique
Marque-p
Les plus visités
mozilla.org
0
Start
Terminé

2009

Now



SMARTEH

Available January 2010

Share ? Re-use ?

AutomForge.net

- Functions
  - GETBIT
  - SETBIT
- Function Blocks
  - Bitwise_Block
  - Test_SFC
    - Transit
      - REA
      - REA
    - Action
      - COL
      - COL

Edit

Share

Delete

Update

Test