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
ISO 61131
IEC 61499
Modbus
CANopen
ETHERNET
POWERLINK
IEC-61131-3 (SFC)

Start

N OUT1 := 0; OUT2 := 0;

CNT2 AND NOT CNT1

Step2 N COUNT2
REACH_UPPER2

Step1 N COUNT1
REACH_UPPER1

Step3 N COUNT1
WAIT1

Step4 N
WAIT2

AND
IN1 OUT
IN2
IEC-61131-3 (LD, FBD)
IF Collision THEN
  Speed := 0;
  Brakes := OFF;
END_IF;

IF (Gate = CLOSED) AND
  (Pump = ON) AND (Temp > 200.0) THEN
  Control_State := Active;
ELSE
  Control_State := Hold;
  PumpSpeed := 10.0;
END_IF;

LD Y1
SUB Y2 (* Subtract Y2 from Y1 *)
ST Temp (* Store Y1-Y2 in Temp *)
MUL Temp (* Multiply by Temp to square *)
ADD( X1 (* Defer ADD *)
SUB X2 (* Subtract X1 from X2 *)
ST Temp (* Store X1-X2 in Temp *)
MUL Temp (* Multiply by Temp to square *)
)
SQR (* Call Square root fun *)
ST ILLTest (* Setup function result *)
GT Tmax (* Greater than Tmax ? *)
JMPC ERR (* Yes, Jump to Error *)
S ERROR (* Set ERROR *)
RET (* Normal return *)
ERR: RET (* Error return, ENO not set *)
Open Standards ditch

IEC 61131-3

Manufacturer specific

Modbus
Bootstrap Freedom
2001

CAN Festival

MatPLC
2003

MatPLC

CANopen

CanFestival Library (ANSI - C) Application

CANopen API

CAN Messages

Timers/Notifications

Hardware Abstraction Layers (Interfaces, OS, libraries, ...)

Hardware

IEC 61131-3 → C++
2005

1) Inkscape +

2) wxPython + Inkscape
<?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>
Plugin based PLC project management
Beremiz IEC-61131 Toolchain

Target PLC configuration

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

C compiler

ANSI-C code

Plugins

User code

[ debug / trace code ]

Target specific code

SoftPLC

function calls

function calls

IEC std lib

POUs params

Variables

Located Vars

IO Lib
2008

Beremiz
Free Software for Automation

CAN Festival

SVG UI /

Generic C plugin
SVGUI plugin

```xml
<?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>
```
C plugin

Retrieve

PLC

Publish

```c
#include <stdio.h>

1. printf("spy1 : %hd\n", spy1);
2. printf("spy2 : %f\n", spy2);

```

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Class</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>spy1</td>
<td>output</td>
<td>INT</td>
</tr>
<tr>
<td>2</td>
<td>spy2</td>
<td>output</td>
<td>REAL</td>
</tr>
</tbody>
</table>
PyRO, ZeroConf

Beremiz
Free Software for Automation

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

C
compiler

ANSI-C code

MatIEC
IEC to C
Compiler

User code

SoftPLC

IEC std lib

Located Vars

read

write

POUs params

Variables

Located Vars

read

write

Target specific code

SoftPLC

IEC std lib

Located Vars

read

write

PyRO, ZeroConf

“runtime”

beremiz_service.py

.so
.dll

python

python
Python Plugin

Retrieve
PLC
Publish

FIFO

python
WxGlade Plugin

'int(HMIFrame.checkbox_1.GetValue())'
SVGUI / web
2009
Now

Available January 2010
Share ? Re-use ?