

**From data to information communication:  
The transparent coupling of  
Industrial controls and  
higher level systems**

-

**Simple and Secure**

**Eelco van der Wal  
Managing Director PLCopen**

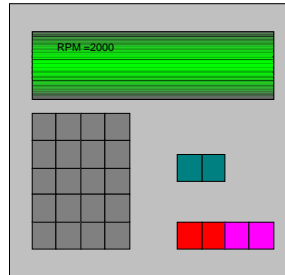
**What is this?**

**1100 1010 0011 0101**

**How do I get access to it?**

**1100 1010 0011 0101**

**Where can I find it?**



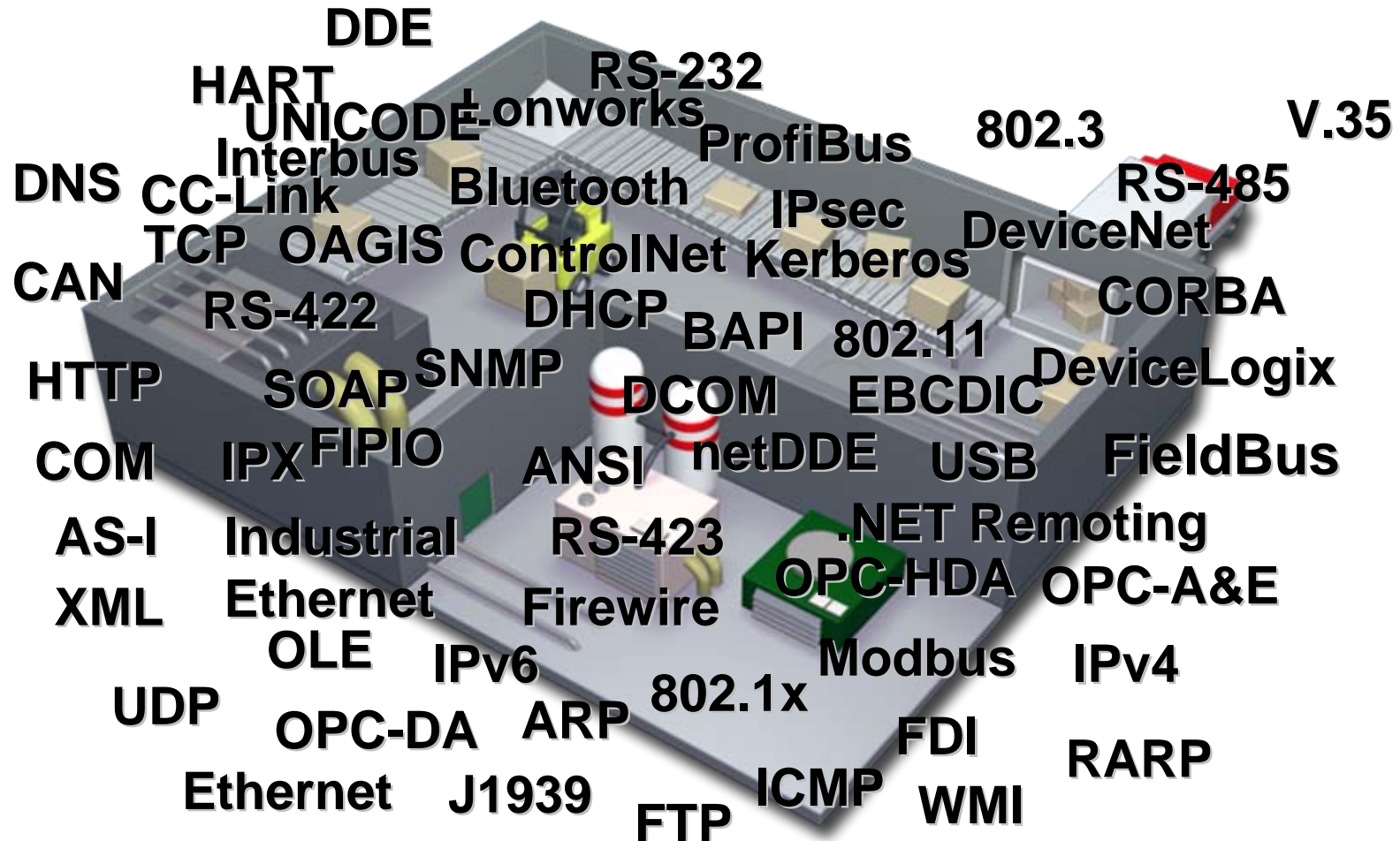
**HMI with graphic representation of temperature value**

*How ?*

**Controller with temperature value**



## Motivation – too many standards



**It is not about the networks**  
**It is about communication**

**It is not about data**

**It is about information**

# Yet another standard?



**PLCopen**  
**for efficiency in automation**

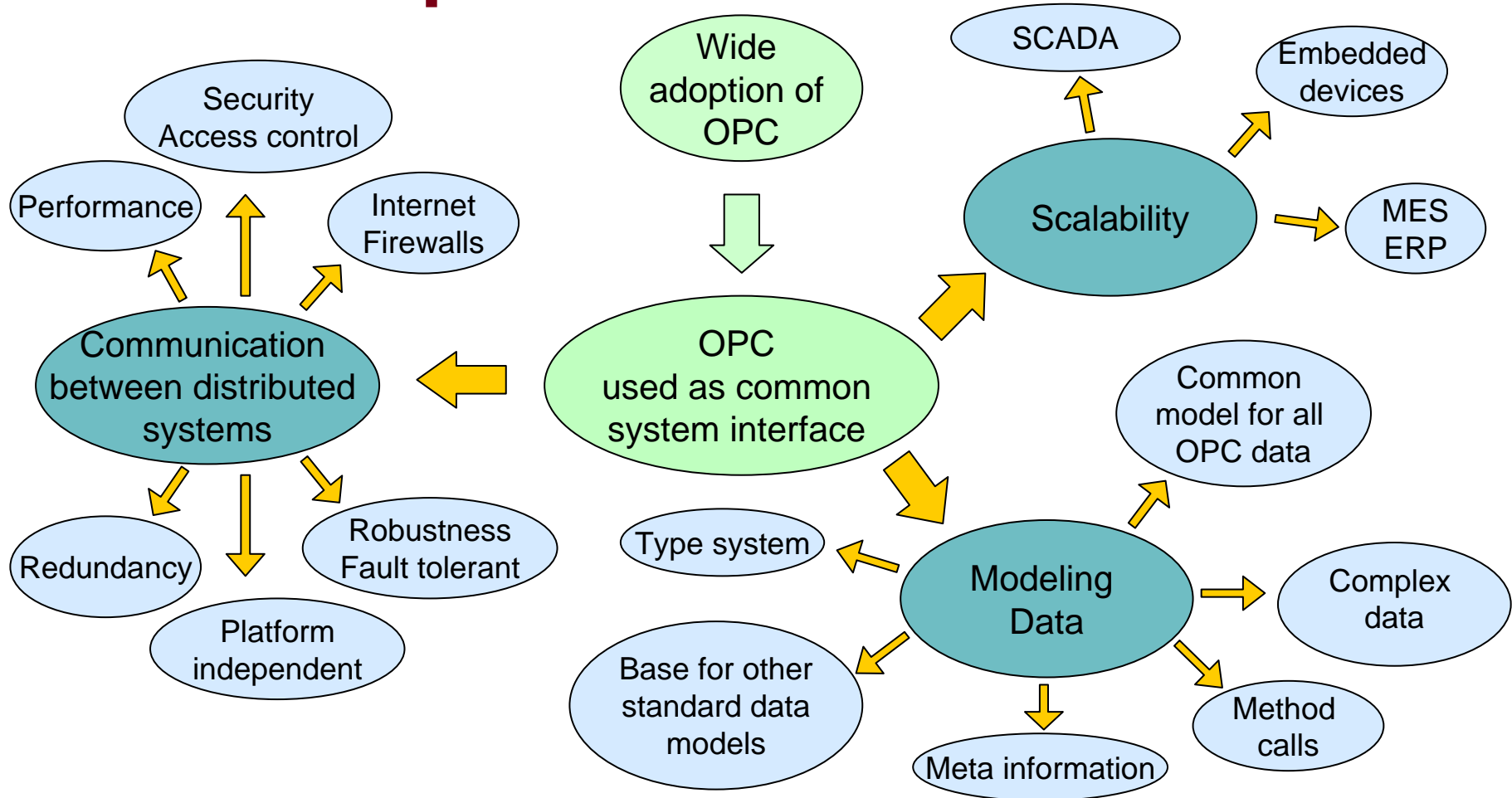
## On the one had....

- OPC DA transfers in to OPC UA
- OPC UA is system independent
- Starting point for cooperation
- First results in 1 year
- Further results planned for
- “Communication will never be the same”

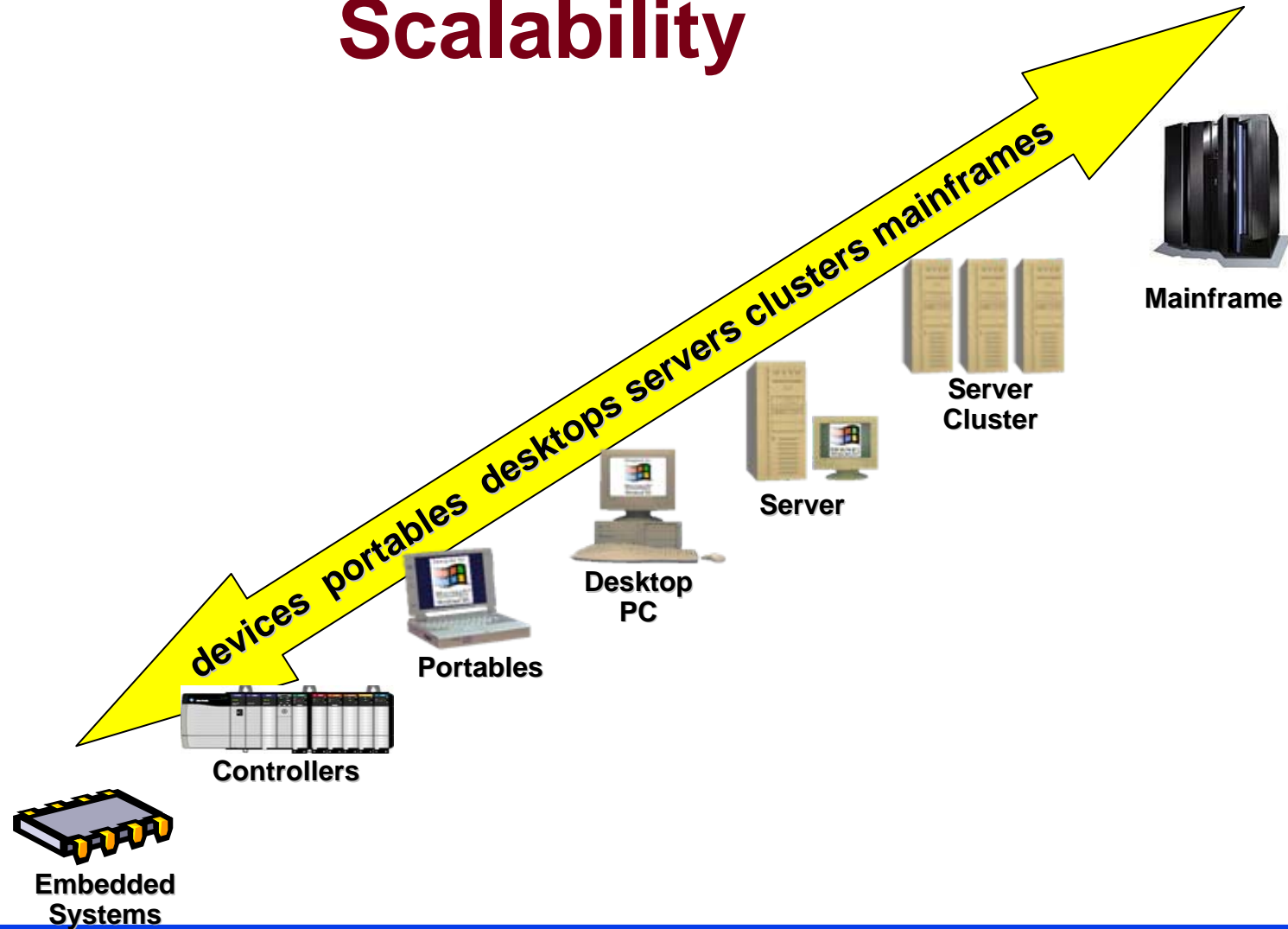
## And on the other side...

- IEC 61131-3 – worldwide standard for programming languages**
- For PLCs, controls, Industrial PCs, PACs, embedded controllers, etc.**
- PLCopen as independent organization extending this and promoting the results**
- On a worldwide basis**

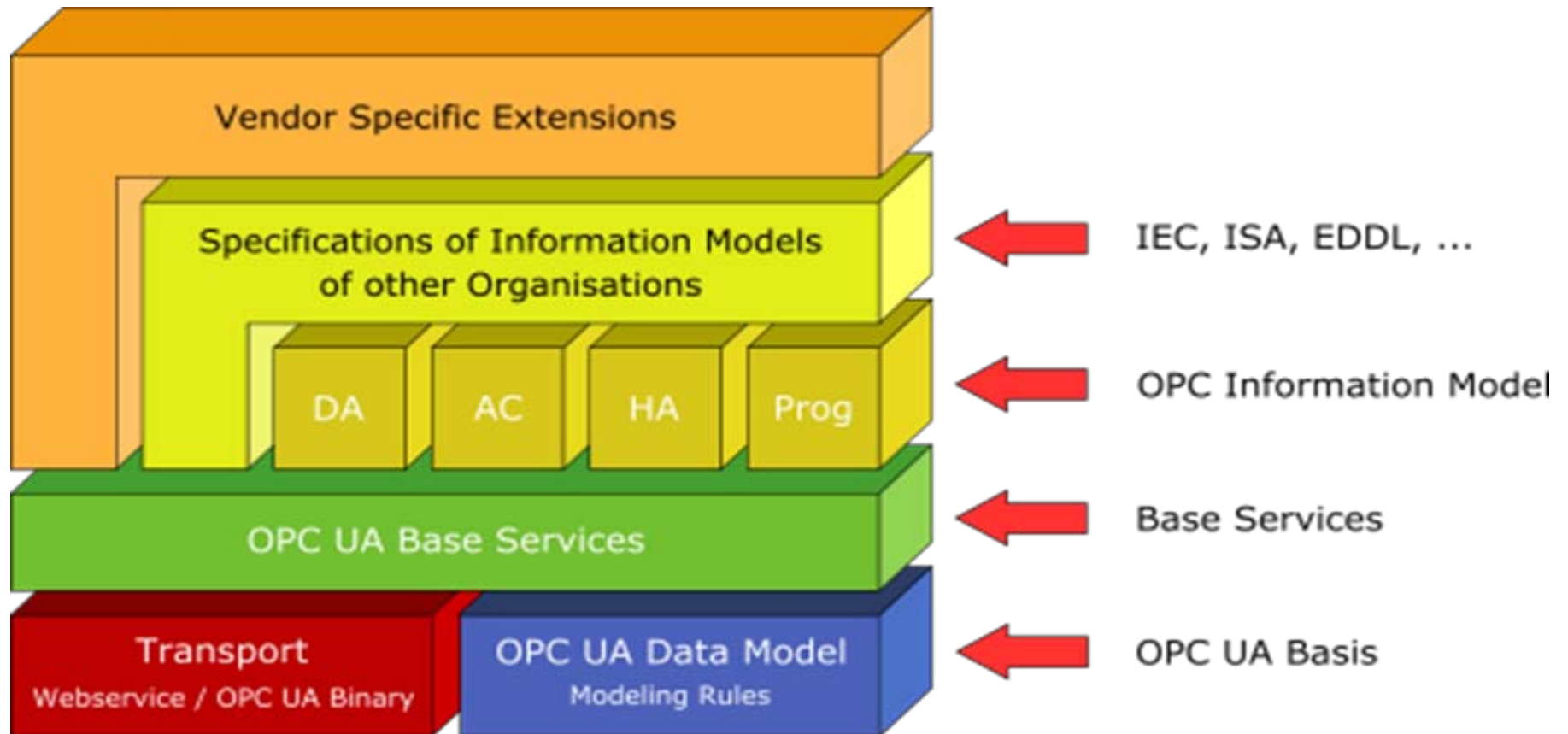
# Requirements for OPC UA



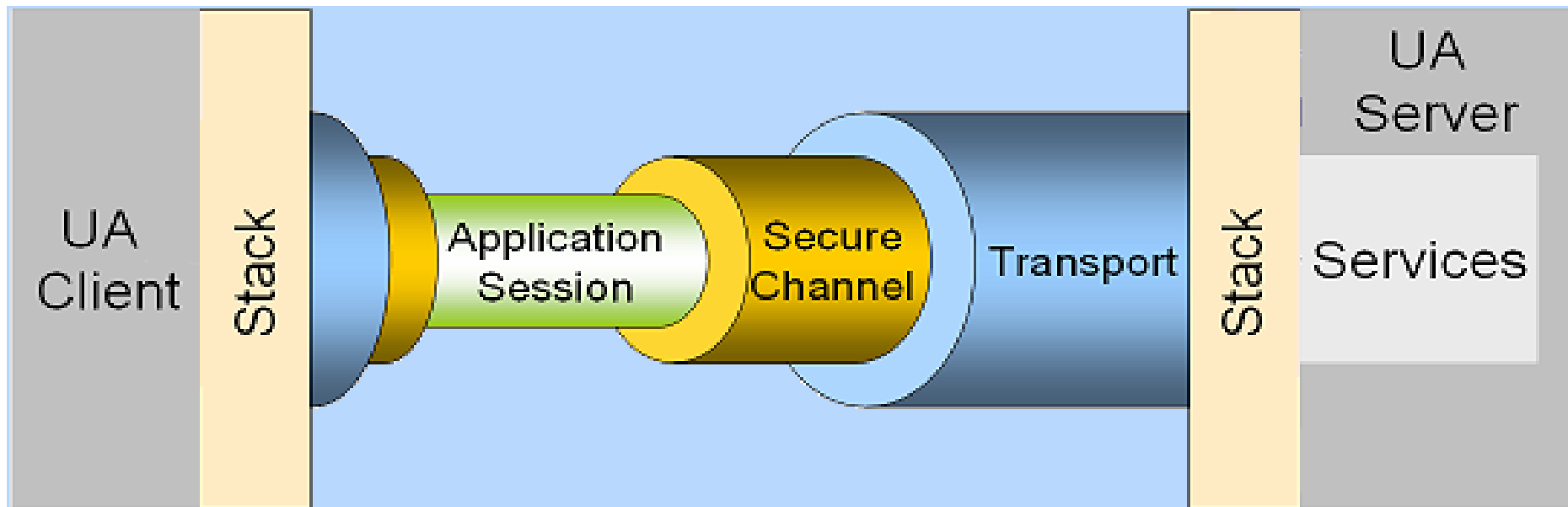
# Scalability



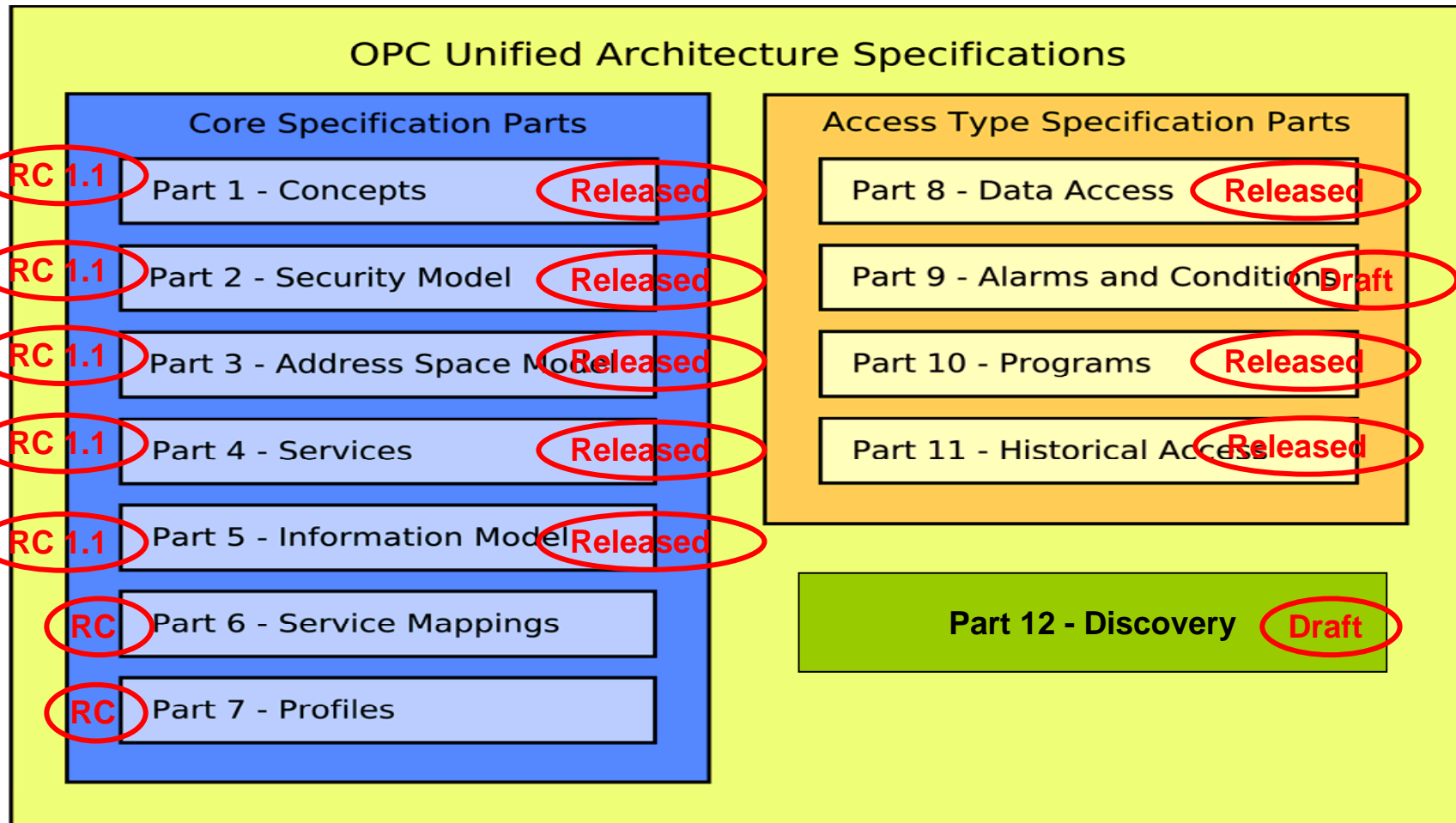
# OPC UA Specification Layering



# OPC Transport and Security



# Status OPC UA Specifications





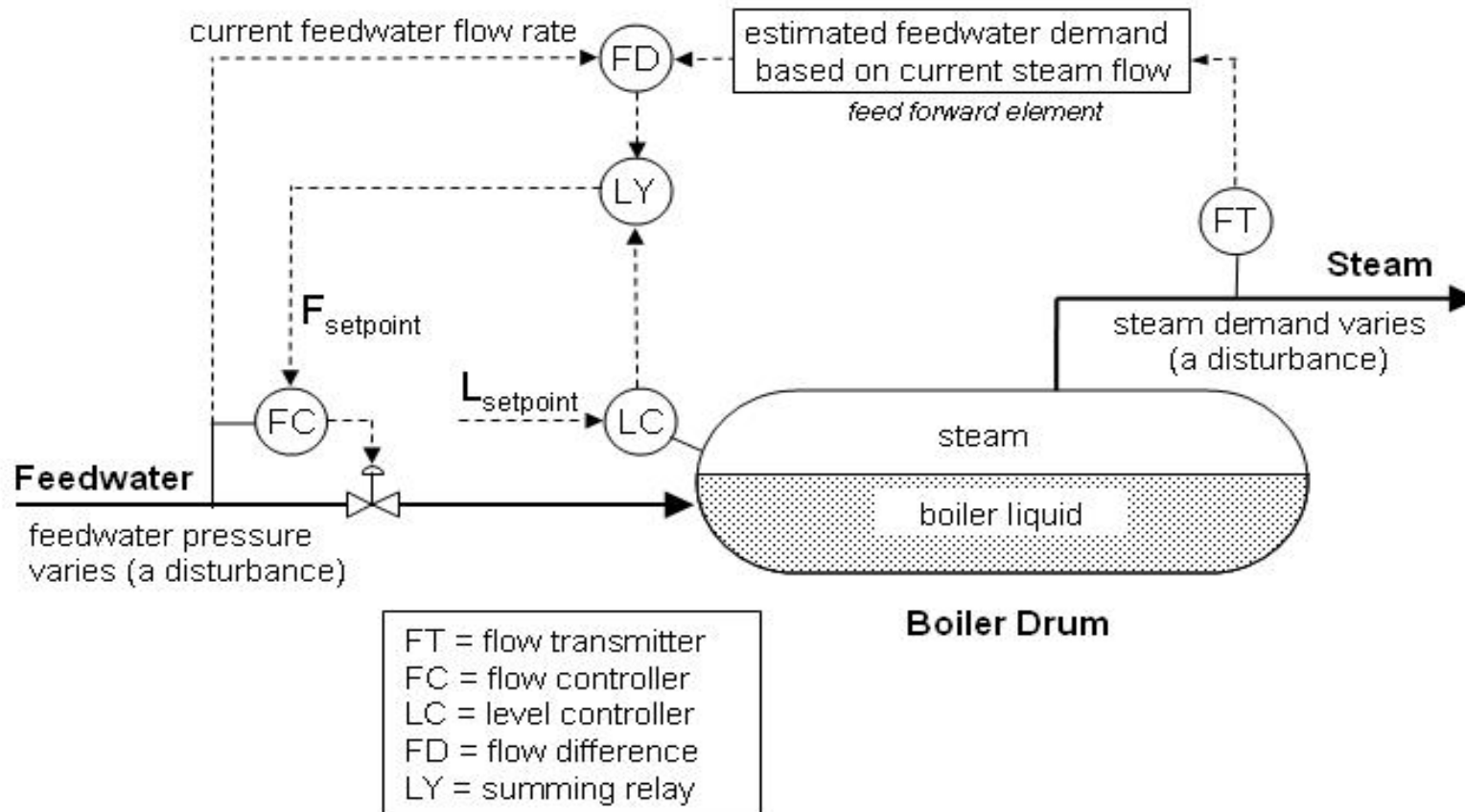
**PLCopen**

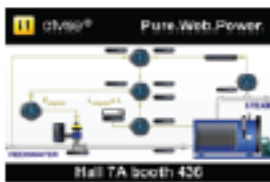
**for efficiency in automation**

# **IEC 61131-3 / OPC UA live demo**

**Mapping of  
the IEC 61131-3 Software Model  
to OPC United Architecture  
Information Model and Namespace**

# Live Demo at HMI & SPS Exhibitions





Vendor: CerTec EDV GmbH  
 Product: aInise  
 Description: Fully featured web HMI in pure web technology



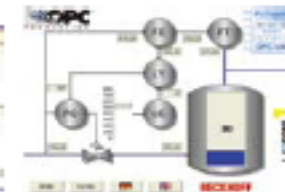
Vendor: Allmendinger  
 Product: Add-on for SIMATIC WinCC  
 Description: OPC-UA Client Channel for SIMATIC WinCC®



Vendor: ICONICS Inc.  
 Product: GENESIS64  
 Description: Microsoft .NET based, web-enabled, OPC based 64-bit HMI/SCADA Suite



Vendor: ascolab GmbH  
 Product: OPC UA Services  
 Description: OPC UA Consulting, Training and Development Services



Vendor: INOSOF GmbH  
 Product: VisiWinNET HMI/SCADA Software  
 Description: Microsoft .NET based HMI/SCADA Software with support for Visual Studio and Expression Blend



Vendor: Beckhoff Automation  
 Product: CX7010-0111  
 Hardware: 500MHz X86 CPU, 512MB RAM  
 Description: IPC with PLC controller and OPC-UA-server/client



Vendor: ifak e.V.  
 Product: OPC UA Generic Server  
 Hardware: SIMATIC 57/900  
 Description: Server adaptable to different data sources



Vendor: Phoenix Contact  
 Product: VALUELINE IPC  
 Hardware: Core 2™ Duo 1,5 GHz  
 Description: IPC with ProCon OS embedded CLR Software and OPC UA communication

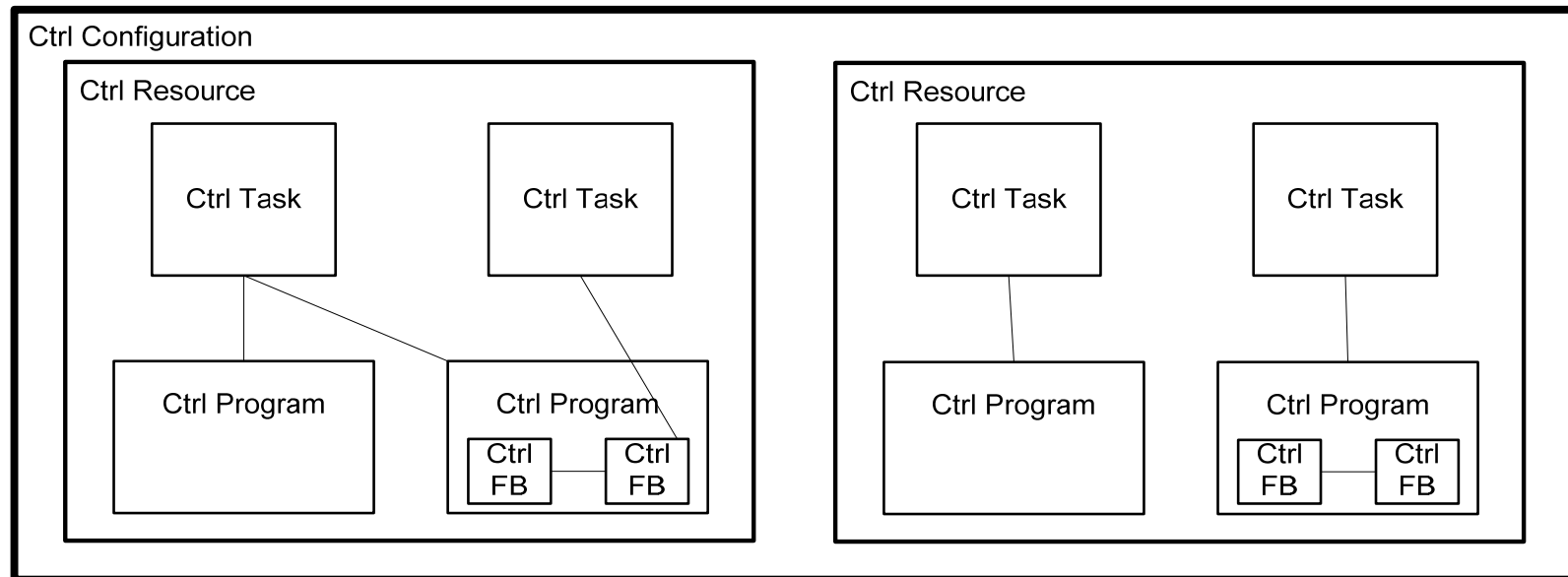


Vendor: Unified Automation GmbH  
 Product: OPC UA Server SDK  
 Description: OPI/a server for PLC address space and Server development tools

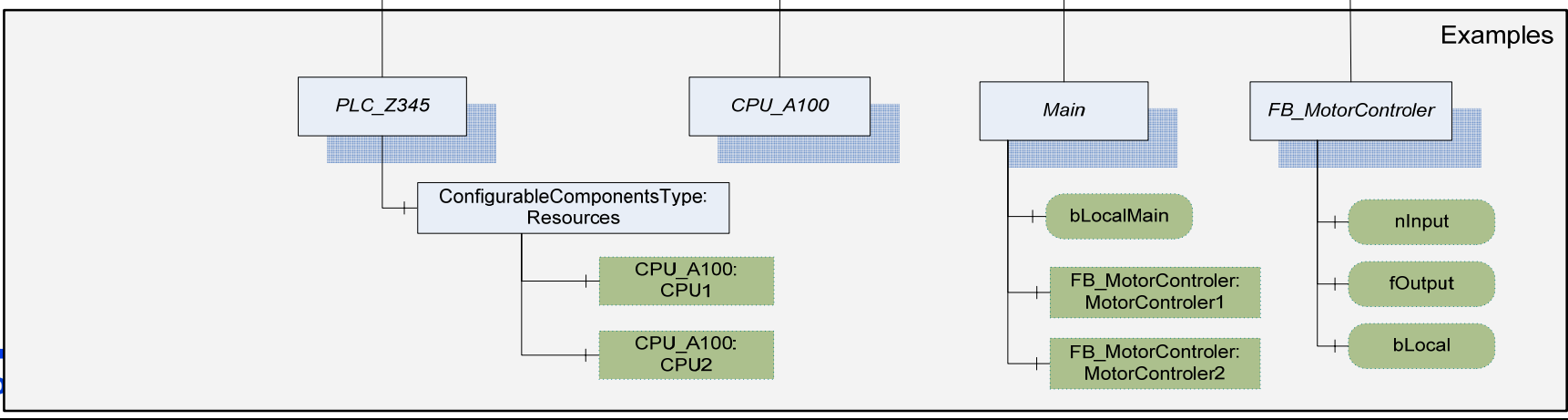
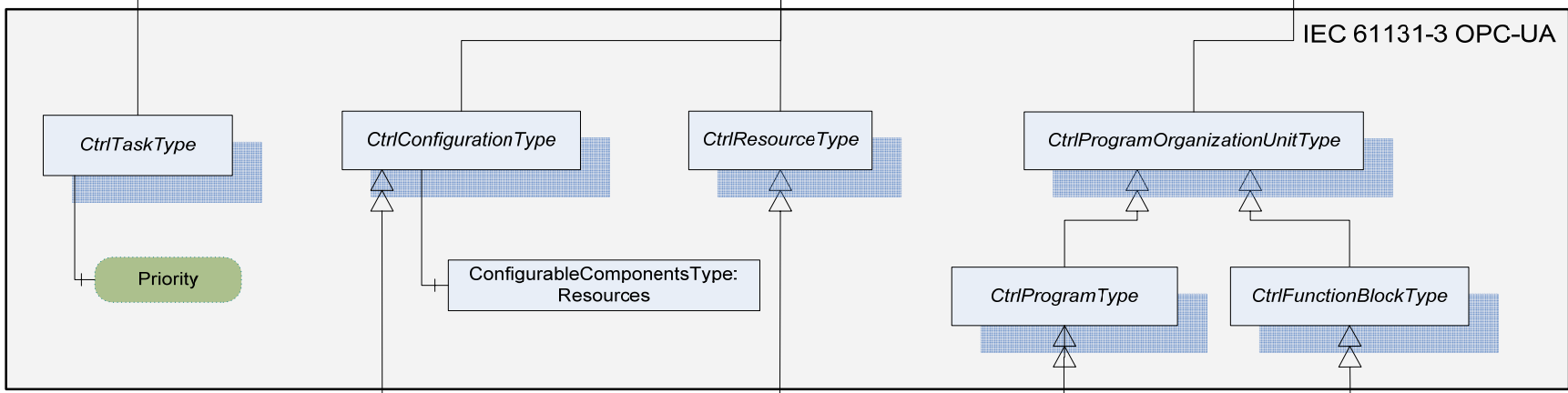
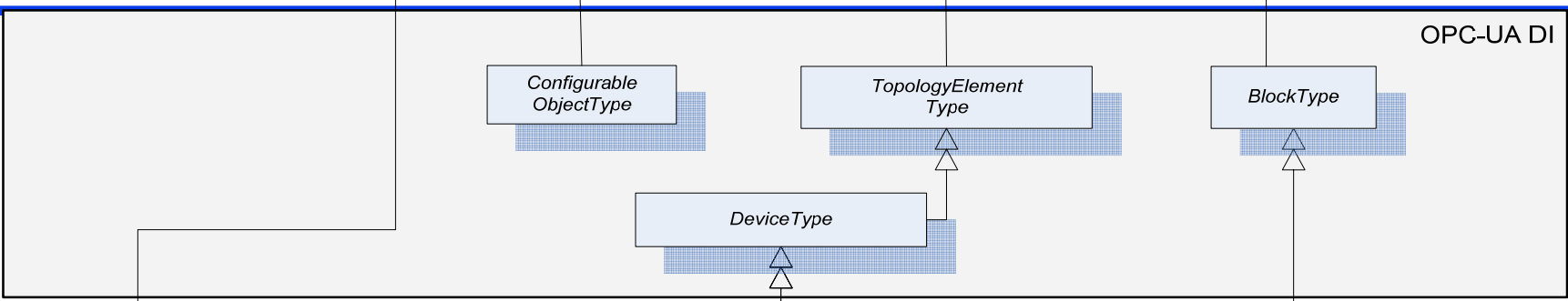
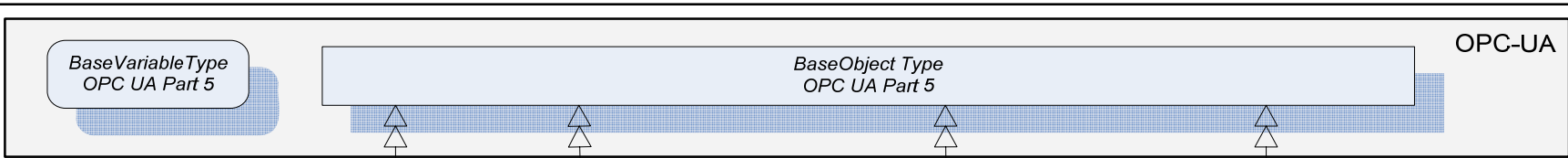


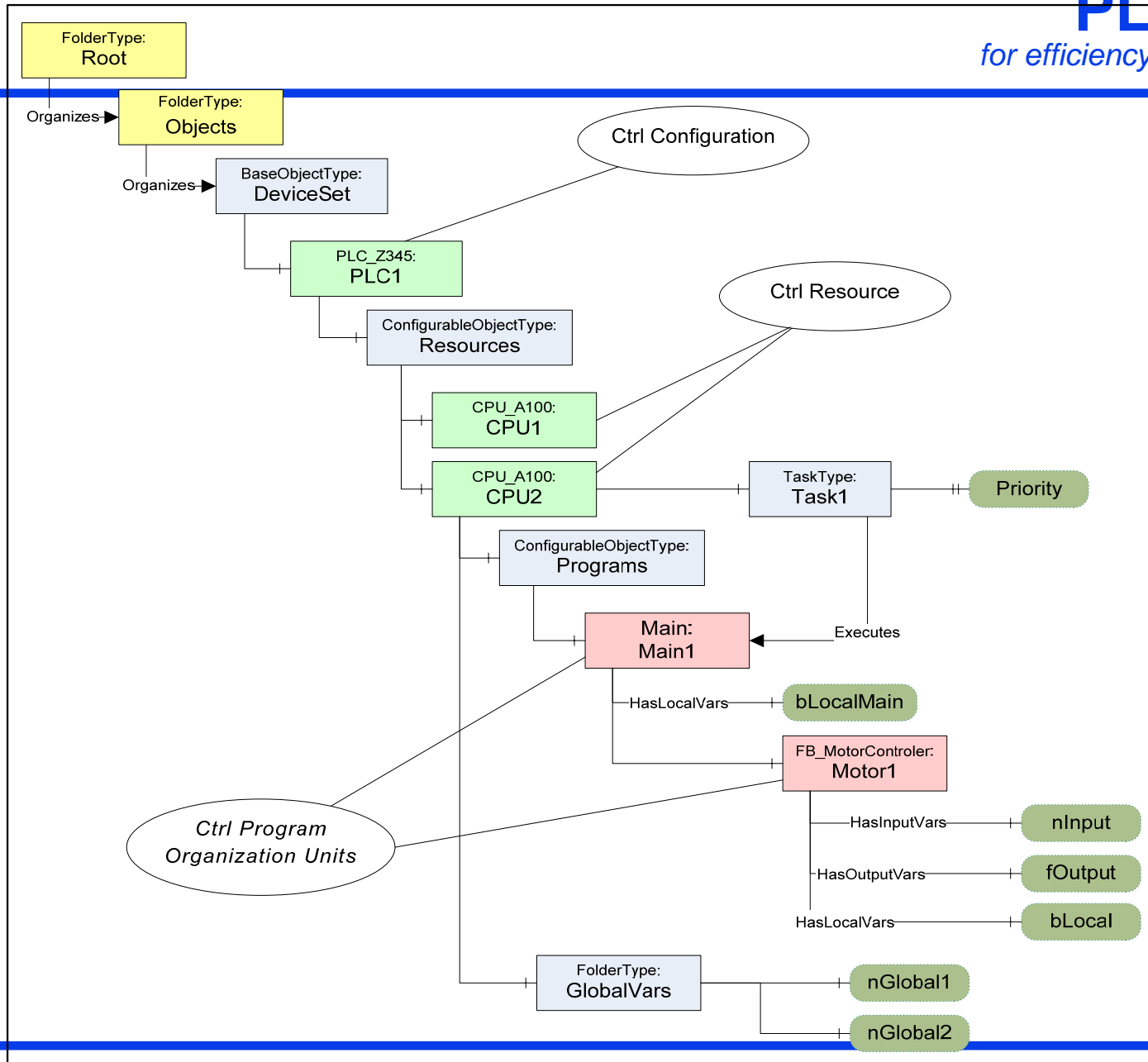
Vendor: logi.cals/MicroSys  
 Product: logLPLC 5200  
 Hardware: 400MHz Freescale MPC5200 CPU  
 Description: Power Architecture, 128MB RAM PLC controller / OEM PLC

# IEC 61131-3 Software Model



The prefix Ctrl is there to avoid conflicts with the OPC UA terminology





# Example: Function Block and Program

```
FUNCTION_BLOCK CTU_INT
VAR_INPUT
  CU: BOOL;
  R: BOOL;
  PV: INT;
END_VAR

VAR
  PVmax: INT := 32767;
  CU_OLD: BOOL;
END_VAR

VAR_OUTPUT
  Q: BOOL;
  CV: INT;
END_VAR

IF R THEN
  CV := 0;
ELSIF (NOT CU_OLD) AND CU AND (CV < PVmax) THEN
  CV := CV + 1;
END_IF ;
Q := (CV >= PV);
CU_OLD := CU;

END_FUNCTION_BLOCK
```

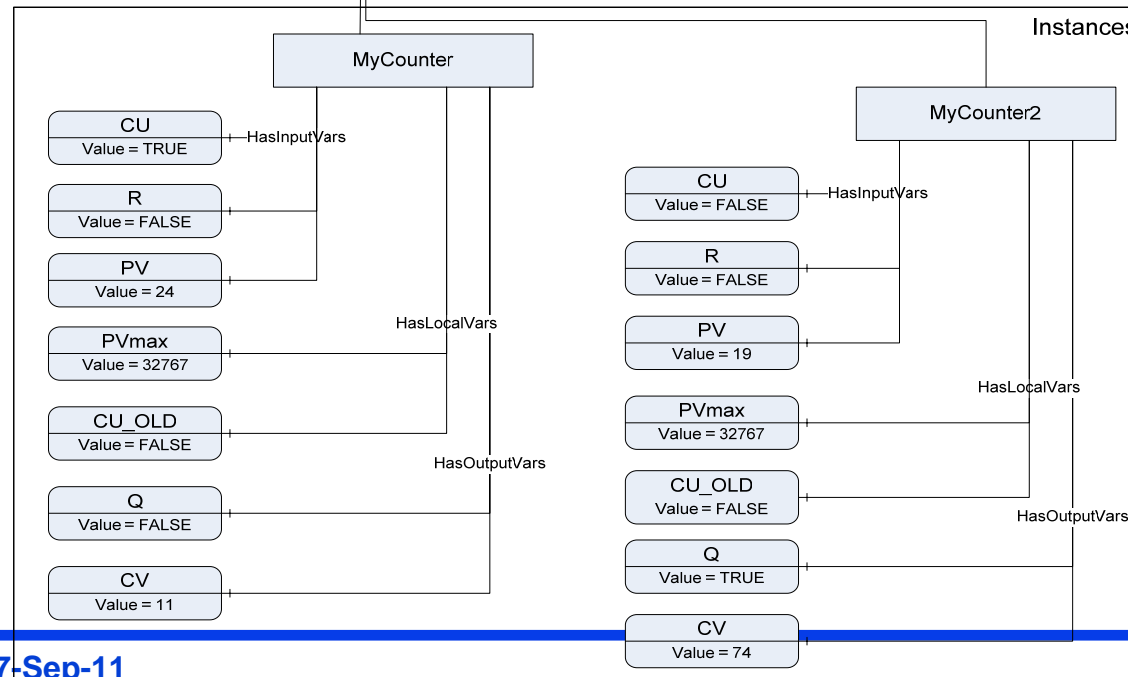
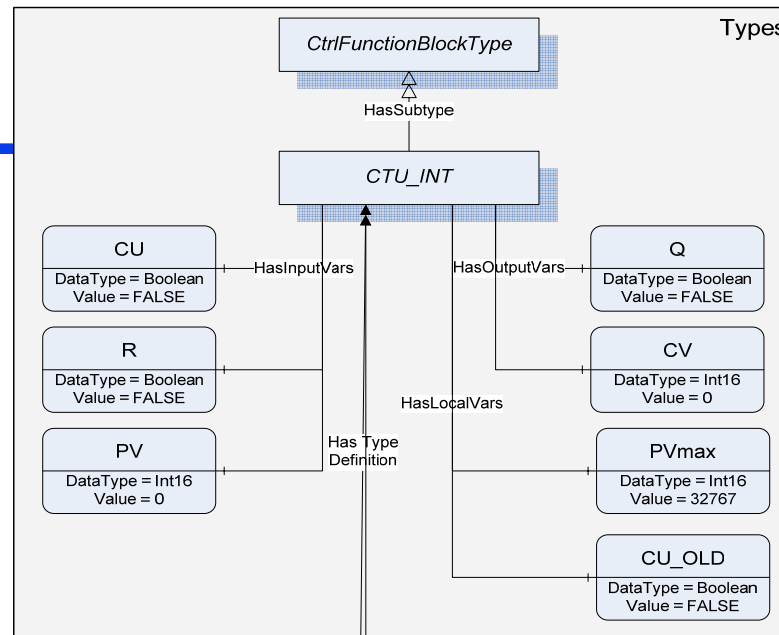
```
PROGRAM MyTestProgram
VAR_INPUT
  Signal: BOOL;
  Signal2: BOOL;
END_VAR
VAR
  MyCounter: CTU_INT;
  MyCounter2: CTU_INT;
END_VAR
VAR_TEMP
  QTemp: BOOL;
  CVTemp: INT;
END_VAR
MyCounter(CU := Signal, R := FALSE, PV := 24);

QTemp := MyCounter.Q;
CVTemp := MyCounter.CV;

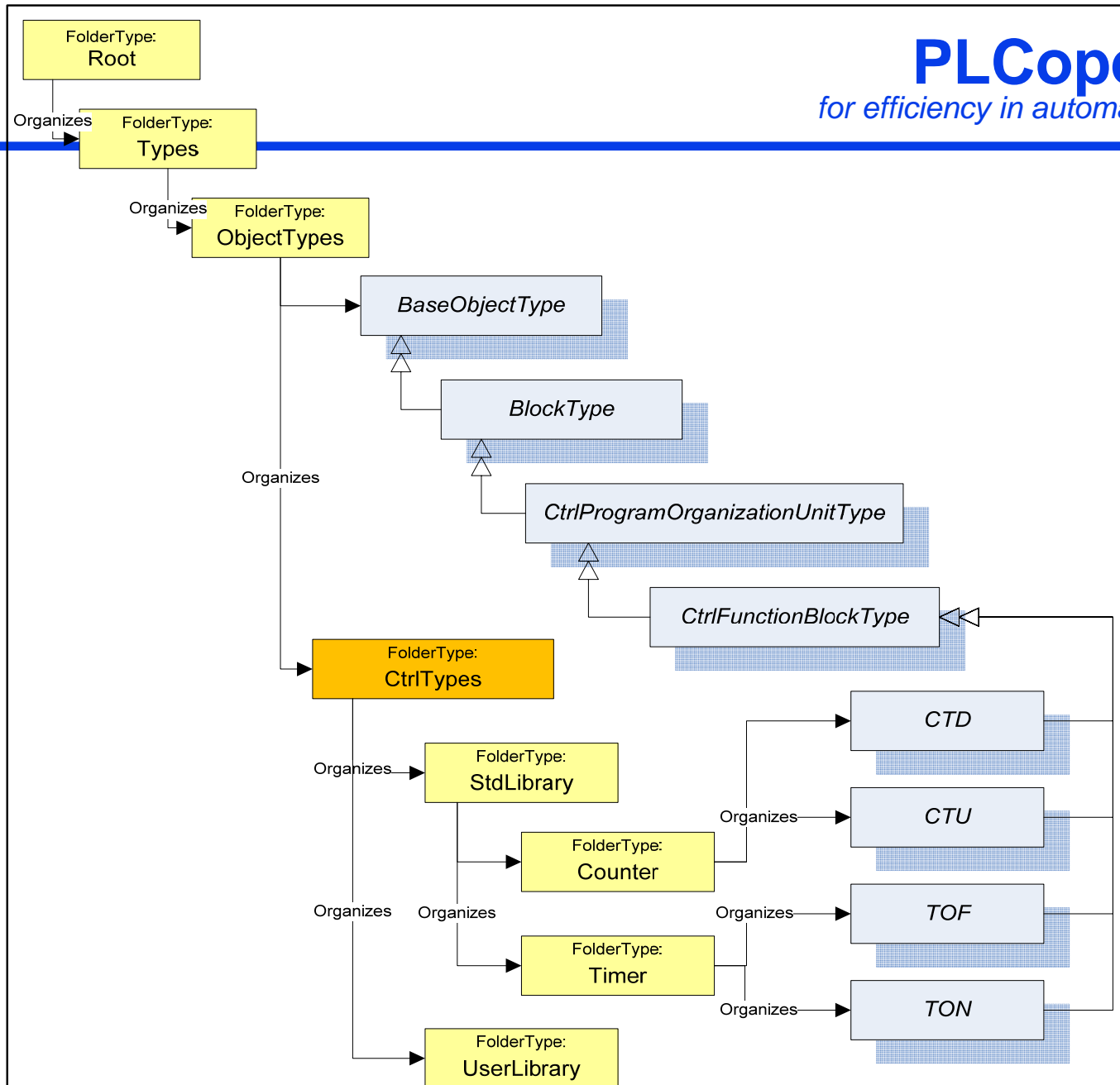
MyCounter2(CU := Signal2, R := FALSE, PV := 19);

QTemp := MyCounter2.Q;
CVTemp := MyCounter2.CV;

END_PROGRAM
```



# Library Structure



# Advantages for users

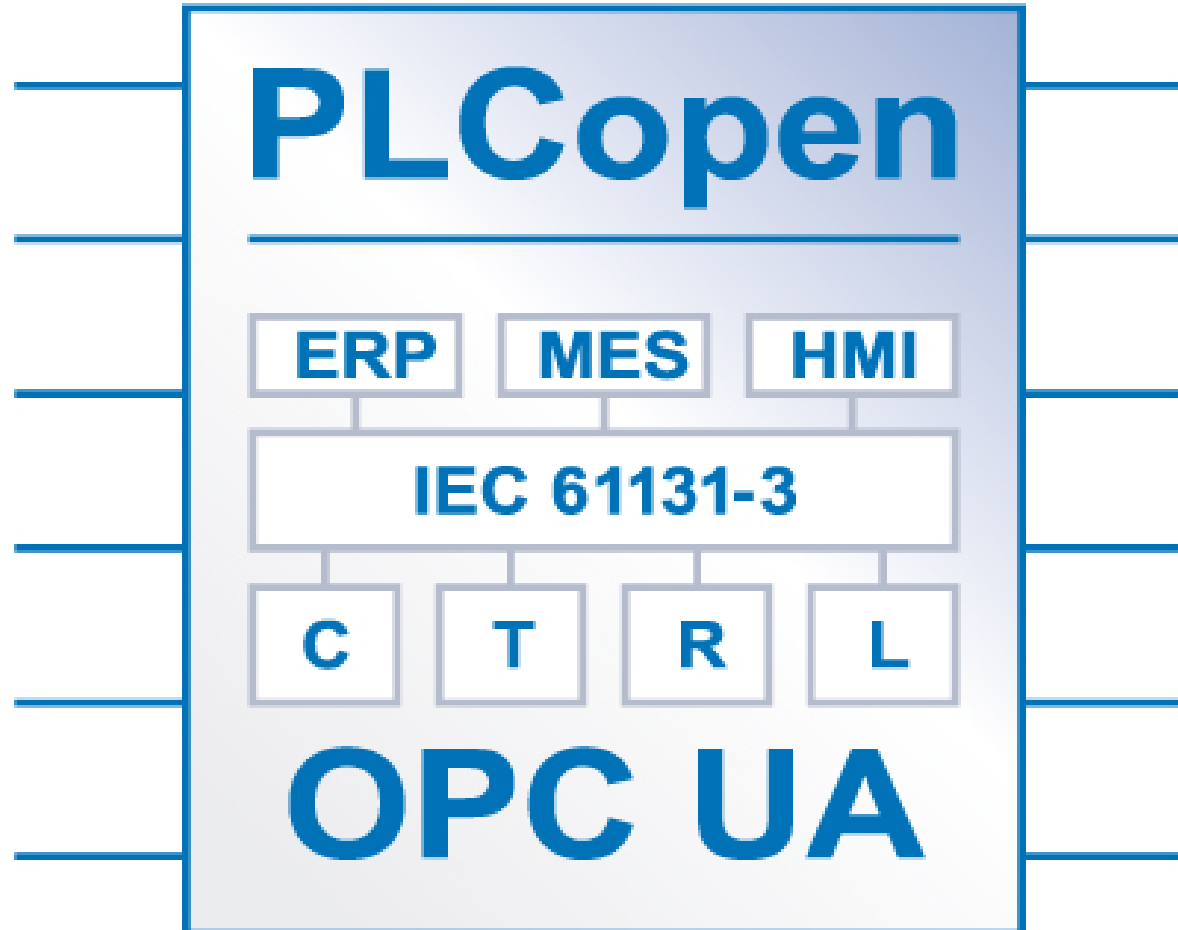
- ❑ **Transparent Access to relevant information**
  - like Variables, Datatypes, Function Blocks, Structures, Tasks, etc.
- ❑ **Less Engineering time in overall control systems (Controller, HMI, SCADA, ERP, etc.)**
- ❑ **Transparent Communication**

**“Communication will never be the same”**

## **New activities**

- Function Blocks for communication (PLC to PLC)**
- MES harmonization**

## The logo



## The cooperation



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**for efficiency in automation**

**Thank you for your attention**  
**[www.PLCopen.org](http://www.PLCopen.org)**

**Questions?**

