# IEC 61499 Day at SPS/IPC/DRIVES'11

## *Industrial Use Cases in Distributed Intelligent Automation*

### Opening remarks

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IEC 61499 Day

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# Goals

- IEC 61499 standard implementations:
  - Open source implementations: FBDK, 4DIAC;
  - Engineering tools as COTS: ISaGRAF, nxtControl;
  - New hardware platform providers adopting the standard.
- IEC 61499 state of art and evolution: IEC TC65-SC65-WG15 and CANOpen SIG;
- Adoption in mature automation markets;
- Penetration in new developing markets;
- IEC 61499 vs IEC 61131, migration paths etc..

# O3neida not-for-profit org

- Established in 2004 (Ottawa-Canada) and 2007 (Brussels-Belgium) as independent not-for-profit organizations in both country;
- Acting as a "network of networks" which supports the development of *Open and Standard Compliant Products and Services* in the automation domain;
- Universities, Research Institutes and Industries as supporting members;
- Partnerships and collaborations with various international bodies as: ISA ( International Society of Automation), OMAC, AA ( Automation Alliance), IMS ( Intelligent Manufacturing System), IEEE, IEC;
- Involvement as partner in MEDEIA, an EU funded project, and IADP;

# O3neida vs IEC 61499

- Identify the standard as a means to allow a formal design of distributed control systems and/or complex systems where equipment from different suppliers needs to be integrated:
  - Open architecture
  - Modularity
  - Reuse
- Sustain the diffusion and penetration of the standard;
- Support technology providers offering IEC 61499 compliant products;
- Initiative as 4DIAC, an open source initiative www.fordiac.org .

# Open Architectures

- **architecture**: The structure and relationship among *functional units* in a *system*.
- **functional unit**: An entity of hardware or software, or both, capable of accomplishing a specified purpose.
- **open architecture**: An *architecture* whose *functional units* are capable of exhibiting *portability, interoperability* and *configurability*:
  - **portability**: Software tools can accept and correctly interpret *library elements* produced by other software tools.
  - **interoperability**: Devices can operate together to perform the functions specified by one or more *distributed applications*.
  - **configurability**: *Devices* and their *software components* can be configured (selected, assigned locations, interconnected and parameterized) by multiple software tools.

# New paradigms: Service orientation

- Machine as a Product;
  - machine,
  - spare-parts,
  - Raw materials,
  - documentation;

- Machine to Services;
  - maintenance services ( refurnishing, rebulding ),
  - machine adaptation for new products,
  - design of new suitable products;

- Services to Machine;
  - Design of a new product package,
  - Validation of the new product package,
  - Design of a new suitable machine.

# O3neida – ISA Book Series

- Part of the collaboration with ISA;
- 8 books covering various themes in the automation domain;
- 3 of them addressing IEC 61499:
  - IEC 61499 Function Blocks for Embedded and Distributed Control Systems Design – Dr. Valeriy Vyatkin, both first and second;
  - Real-Time Execution for IEC 61499 – Dr. Alois Zoitl.