ABB Control Systems Annual Partner Conference 2019
Modular Automation – Are you ready
Break Out
Modular automation
Are you ready?

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Presenter Profile:
Short profile / bio / experience / expertise (2-3 sentences)

Synopsis:
Help your customer to increase flexibility and optimize production.

What you will learn:
• Market drivers
• What is behind the Standard MTP
Motivation and market drivers

Increase competiveness

Reduce time to market

- Reduces development cycles
- Shorter commissioning time
- Adjustment of production

Competiveness

- Increased Competitiveness
- Reduced Time-to-Market
- Increased Flexibility
- Improved Efficiency

Flexibility and Efficiency

- Customized, individualized products
- Reduced product quantities
- Small product quantities
- Productivity, availability
- Resource and energy efficiency
- Sustainability

Modular Production as Key Technology
Views of Modular Process Plants

Production plants - modularized, package units, containerized (Module)

Source: Clariant
Modular Automation

Targeted industries

Pharmaceutical industries

Biotech industries

Fine chemical industries

Food and Beverage
Modular Automation

Value Proposition – Different Stakeholders

Plant Owner
- Increased production flexibility through fast reconfiguration
- Module is simply integrated into process automation system
- Module-based planning approach allows a substantial reduction in development time and engineering effort.

Module vendor/ OEM
- Low risk of integrating module at any modular-capable site
- Standardize modules on automation HW and SW
- Protect intellectual property of a module

System Integrator
- Engineering design, installation and commissioning is quicker for intelligent modules
- MTPs can be sent ahead for virtual commissioning to simulate integration on the process orchestration level.
Modular Automation

**Concept**

**Process Orchestration**
Combines the MTPs into a system

**Module Type Packages**
Freely choose the MTP packages from suppliers

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Open architecture network

Reduce cost, risk and schedule by
- Reduced non-standard interfaces
- Reduced commissioning time
- Reduced engineering time
- Better trouble shooting
- Reduced integration time of 3rd party systems
**MTP (Module Type Package) – Automation for Modular Plants**

**Standardization**

- NAMUR ➔ VDI VDE ➔ IEC VDE / VDI
  - General Concept and Interfaces
  - Modelling Operator Interface (Tags and Topology)
  - Modelling for Module Services (Services)
  - Runtime and Communication
  - To be addressed: Diagnosis, Alarm Management, Safety Validation from MTP and Modular.

Next Step ➔ IEC work started

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**MTP is a standardized non-proprietary description of modules for the Process Automation**
NAMUR – Automation for Modular Plants

Scalable System Architecture

Orchestration layer

Engineering & Maintenance
Module Integration
(Plant Configurator)

Supervisory control

Module layer

3rd party PLC

via OPC UA

MTP: Modular Type Package

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Modular Automation

Engineering workflow: Module configuration and integration into an orchestration system

1. Project independent Module-Engineering
2. Export
3. Automatic generation
4. Get
5. Project dependent Plant-Engineering
6. Integration of Modules into the orchestration system
Moving towards modular automation for higher flexibility

Intelligent modules with Services, described in Module Type Packages (MTPs)
Module Engineering with the Module Designer

Definition of module-based Plant Topology

1. Project independent Module engineering
   - Instrumentations Tags
   - Module Services (e.g., Fill, ..)

2. Export Module to Controller

3. Automatic Generation of MTP Definition File

MTP File
- HMI displays (instruments, pipes, ..)
- Communication (Tags, Variables, ..)
Moving towards modular automation for higher flexibility

Intelligent modules with Services, described in Module Type Packages (MTPs)
Plant Engineering with the Orchestration Designer

Definition of module-based Plant Topology

Module type library -> one click import of MTP

Plant structure definition via drag and drop

OPC UA server address
Module Instance Name
Plant Engineering

Automatic Generation into Process Control System 800xA

Current and possible successor state for a module function

Module Symbol

Faceplate for 1 Level

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Pharma 4.0 and Modular Automation

Show-casing a Biotech downstream process, from pilot project jointly done with Bayer, automated with Freelance controllers

Fully functioning module:

- Loading MTP based automation, load different services based on other MTPs, run module via modular enabled System 800xA

Achievements: Commissioning in literally „5 mins“:

- Read MTP, Create upload file and start upload,
  Services ready to run

Next steps:

- Set up a production train consisting of three modules incl. 3rd party module automation
- Evaluate use cases: rearrange modules, module failure, overload scenarios etc

Modular Automation Pilot at Bayer AG
Pilot Project BASF – OPAF demonstrator

Launch NAMUR General Assembly 2019

OPAF = OPC UA + MTP

1. ABB 800xA selected as
   a) 800xA as HMI (OT)
   b) AC800M Soft as Supervisory control (RTAC)
2. PHOENIX PLC Next selected for Module level
Summary
What should be included

- Namur end-users are the MTP market drivers
- MTP enabled products by ABB
- First Module Vendors are operating
- Core of standardization is in final white print status, more to follow

- Channel partners are needed!
  - to team-up with Module Vendors