Engineering for a better world.

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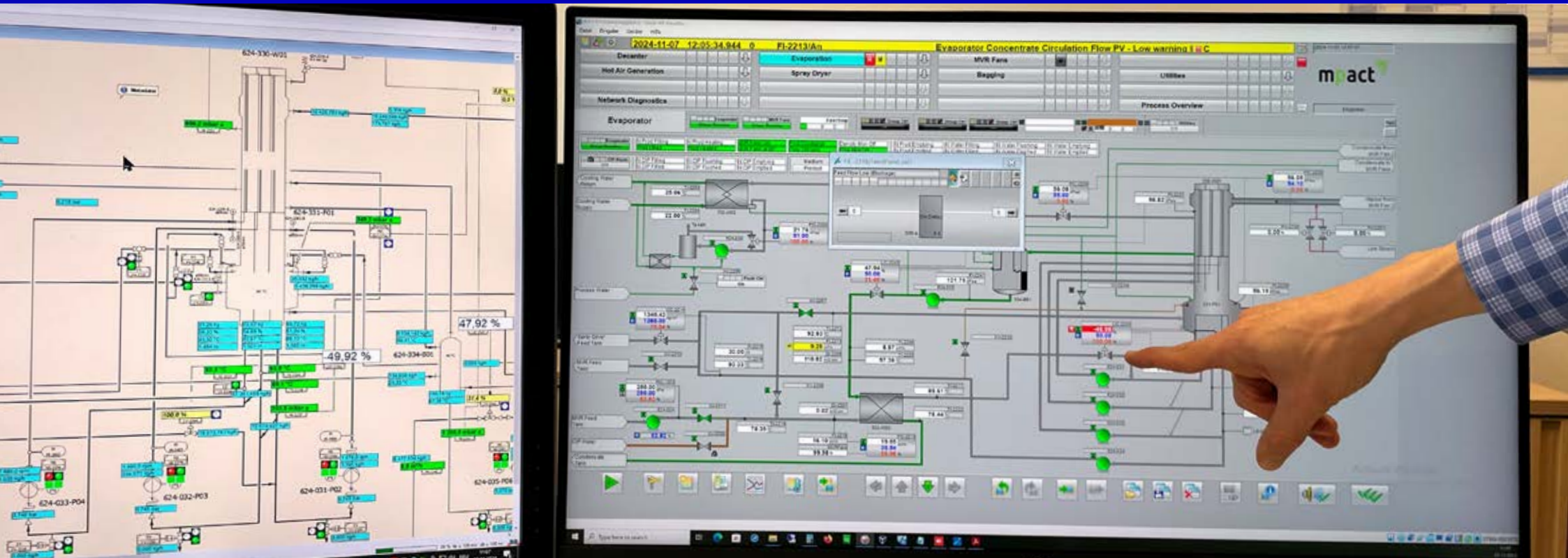
GEA DynamicProcessTwin

Dynamic Process Simulation for
Virtual Commissioning and Operator Training



More than a digital twin. Test – improve – train. In safe area.

Simulate – Activate – Validate.
The GEA DynamicProcessTwin is a dynamic process simulation that is connected to the automation system (PLC) instead of the physical and real process plant.

The operator can use the original operating and monitoring system (HMI + SCADA), which communicates with the PLC, to operate the plant: start-up, production, shut-down, cleaning, respond to errors, test variants, etc. ('Flight Simulator').

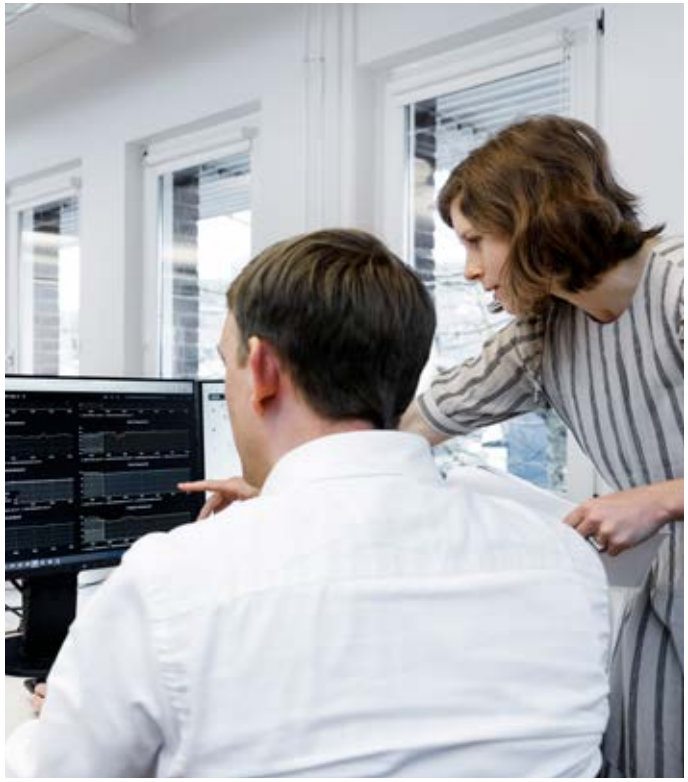
Our experts use the WinMOD® software to create a process simulation that reacts to the control commands and provides all sensor signals to the control. The system allows real-time dynamic process simulation for the production process.

The setup is done in three layers:
- Simulation of the PLC's inputs and outputs (I/O signals)
- Simulation of the feedback signals, e.g. pumps, valves...
- Real time calculation of response of the process variables, e.g., pressure, temperature, flow, density...

We can safely test most functions of PLC + HMI + SCADA in combination with the design data of the pumps, valves, heat exchangers, etc., before the actual commissioning of the plant.
These risk-free tests lead to an extraordinarily improved software quality:

- Testing all inputs and outputs with measurement ranges, tag names, comments
- Testing of interlocks and switches with their limit values
- Testing human-machine communication, the HMI layout
- Testing alarm and error messages
- Testing trends and archives
- Testing controller interconnections, optimize parameters
- Testing sequential control system: start-up, shut-down, production, CIP...
- Testing coupling signals to other parts of the plant
- Playing through disturbance and error scenarios.

The system is excellent for operator training.



Your plant production process virtual available ahead of commissioning.

Display Commands and Simulate Signals
The automation system (AS), consisting of a controller (PLC) and an operating and monitoring system (HMI + SCADA), is connected to our simulation workstation, which uses the WinMOD® software to simulate the hardware structure of all inputs and outputs.
Controllers from Siemens, Rockwell, Schneider Electric, and many others can be connected.

Simulation of Device Feedback and Analog Sensors
All actuators in the system can be controlled and provide their operational and malfunction signals to the PLC.
All analog values are simulated.
This allows for the verification of correct addressing, measurement ranges, and basic functions of the devices.

Dynamic Process Simulation
The GEA DynamicProcessTwin calculates in real-time the behavior of the process plant in response to the actions of the actuators. For example, the flow rate is determined from the pump pressure and valve opening, temperatures at heat exchangers, and concentrations of solids are calculated. These values are transmitted to the sensors – thus, the control system "sees" the current process state. The dynamics of these changes closely resemble reality.

Potential Benefits

The time duration and effort required for the on-site commissioning of the plant are significantly reduced.
PLC program errors are corrected and fixed before commissioning, without the plant being assembled.

The complete control system is risk-free tested and checked: starting and stopping, sequence chains, safety chains, CIP, etc.

Training for the operating personnel can start weeks before the actual commissioning with the GEA DynamicProcessTwin, allowing for a vertical commissioning without unnecessary time and product losses.

Experience shows that higher software quality is achieved. Due to detailed testing, a largely "Plug and Play" is prepared for the PLC and HMI/SCADA software.

Examples of using GEA DynamicProcessTwin:

- Coffee extract evaporators in Colombia, Switzerland, Vietnam, Russia
- Caprolactam evaporator, China
- Evaporation plants for fermentation solutions in France
- Evaporators and steam generators for wood press wastewater - France, Poland, Spain
- Milk evaporators in Germany
- Bioethanol factory in Slovakia
- Complex distillation plants in Germany, Austria, Scotland
- Filtration plants in Germany
- Freeze dryers, spray dryers in Denmark
- Refrigeration systems, heat pumps in Denmark, Germany

Automation System

Operator Station
HMI = Human Machine Interface
with HMI program

Process Controller
PLC = Programmable Logic Controler
with PLC program

Real Process Plant

Virtual Process Plant

Dynamic Process Simulation
Workstation with WinMOD® & GEA Process Simulation

I / O-Signals simulation

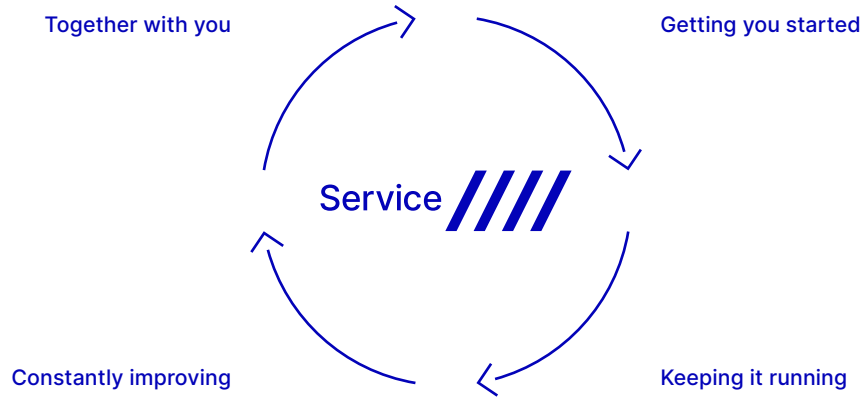
Devices & Feedback simulation

GEA Process simulation

FOR YOUR CONTINUED SUCCESS.

GEA Service offers dedicated teams of service experts. Our focus is to help our customers build, maintain, and improve their performance, market presence and competitive edge for the entire life cycle of their plants and equipment.

Partnering with GEA gives you the benefit of our world-renowned, customer-tailored service and recommended spares upgrade, modernization and optimization services. With our support you can be certain that every piece of GEA equipment and technology will operate optimally from day one, and for its complete lifespan, to give you maximum return on your investment.



Getting you started –
Seamless support for instant productivity and performance

Keeping it running –
The cost-efficient way of ensuring safety and reliability

Constantly improving –
Sharing our knowledge to safeguard your investment

Together with you –
Enduring commitment to you and your business

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