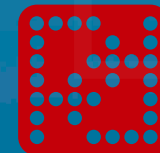


# VIGO6 & COPP

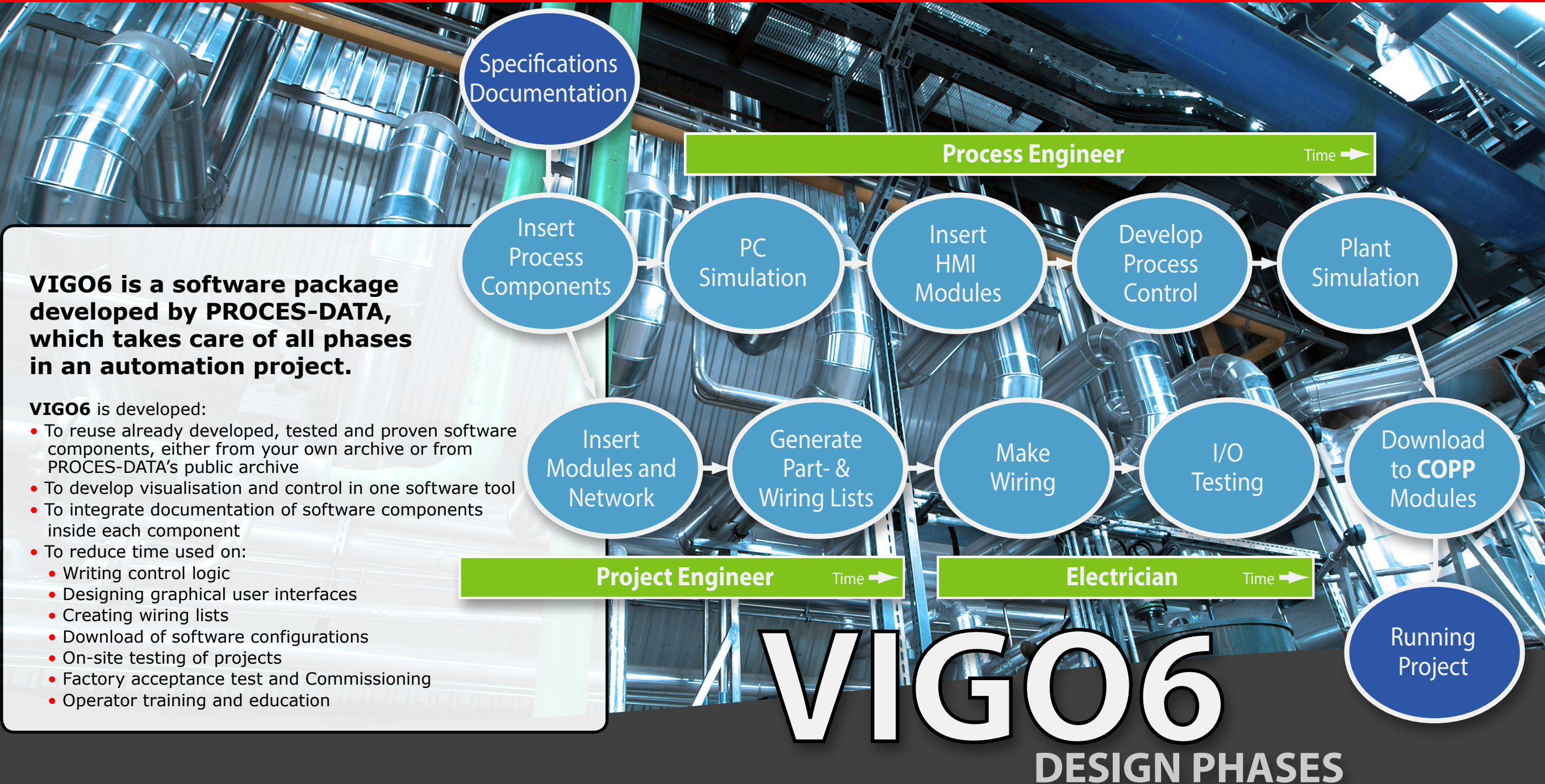
The complete integrated software and  
hardware suite for Automation Projects



**PROCES-DATA**



# Project Design - It has never been easier!





## Specifications

The first step in an automation project is to get an overview of the customer's requirements.

The requirements include floorplans, mechanical drawings, PI diagrams, functional descriptions, etc.

These requirements are used as basis for creating projects in VIGO6.

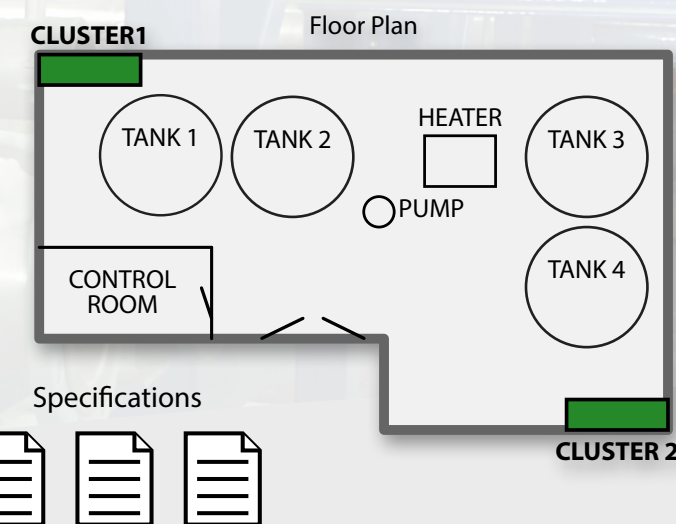
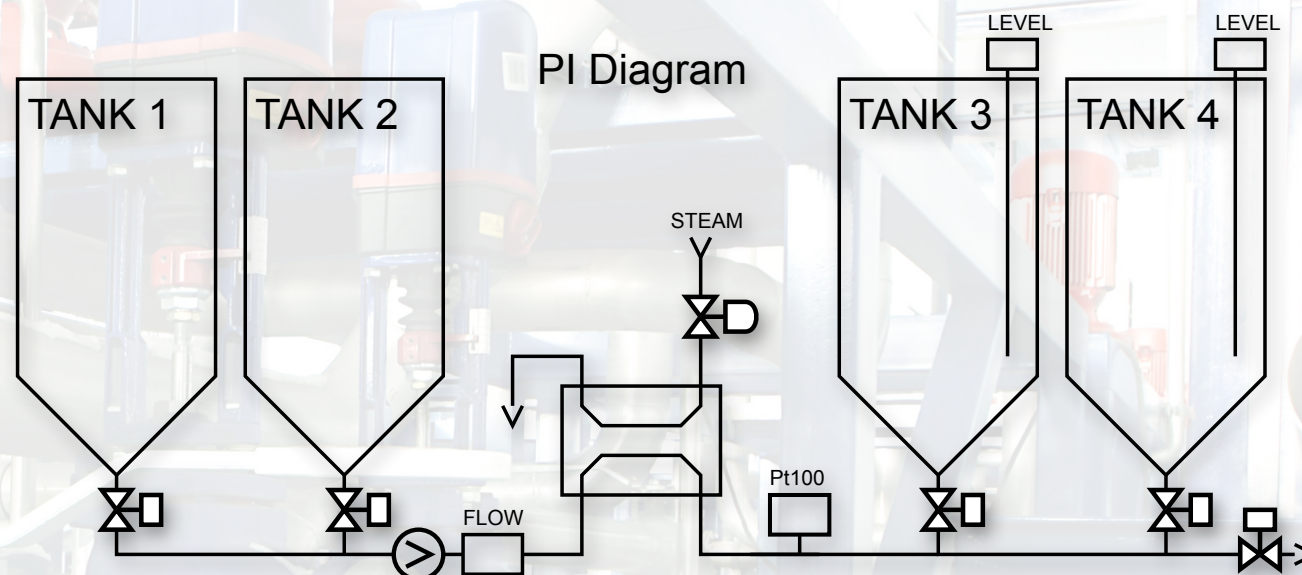
In our 6 steps guide we will use a mixing system, illustrated by the floor plan and PI diagram shown on this page.

The mixing system comprises a number of mixing, heating and storage facilities before the final mix is pumped to the next process.

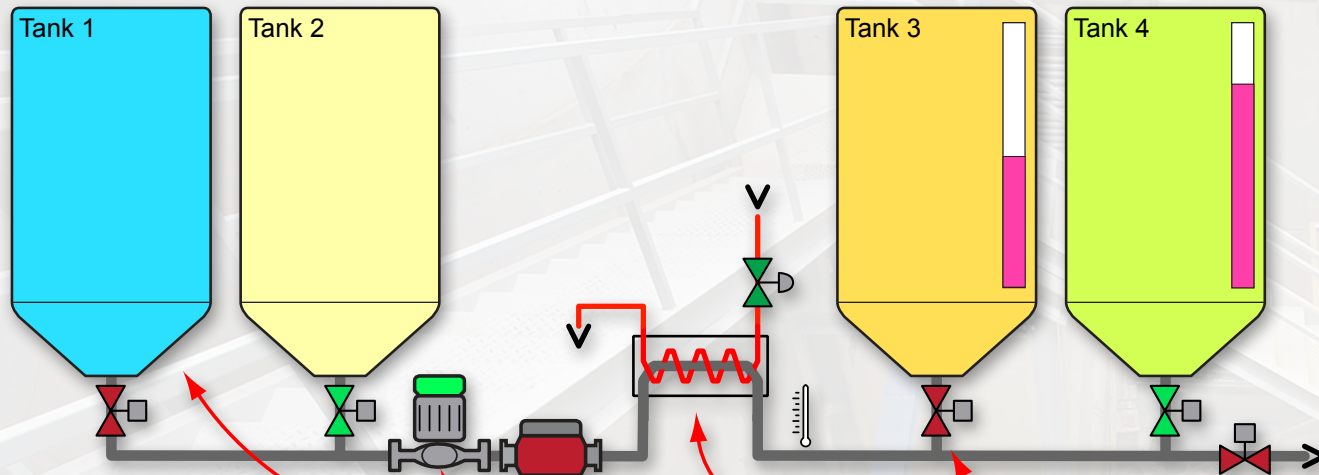
The mixing system consists of 4 tanks, 1 heat exchanger, 6 valves, 1 pump, 1 Flow Transmitter, 2 Level Sensors and 1 Pt100 sensor.

In this example the floor plan shows allocation for two clusters for the control system hardware.

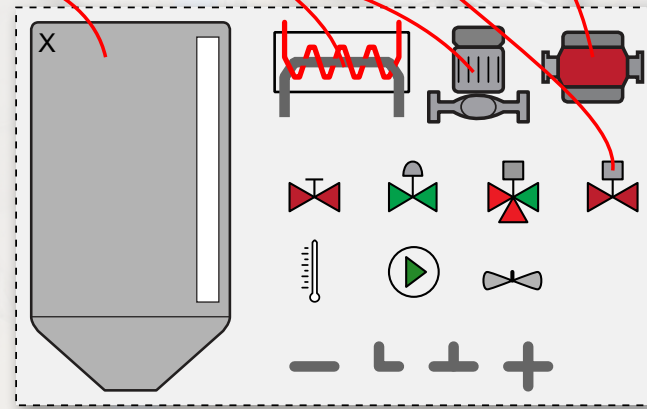
## Design Example







## Drag & Drop



**VIGO6 Archive**

## Create project and insert process components

The Process Engineer can easily Drag and Drop ready-made Process Components, representing the various Plant Parts, from an archive.

The Process Engineer interconnects the Process Components with lines / connectors to visualise the flow of materials or simply the connection between plant parts.

After configuring parameters for the different Process Components specific to the mixing system. e.g. tank size or maximum temperature, the VIGO6 project is ready for offline test and simulation.

Simulation as an initial test of the integrated visualisation and user interface is thus possible without having any hardware set-up.



## Placing process and HMI components in clusters

### I/O distribution

The Project Engineer distributes all process components that require I/O in clusters by drag and drop. The principle is to locate the I/O in the Cluster giving the easiest cable routing and shortest cable.

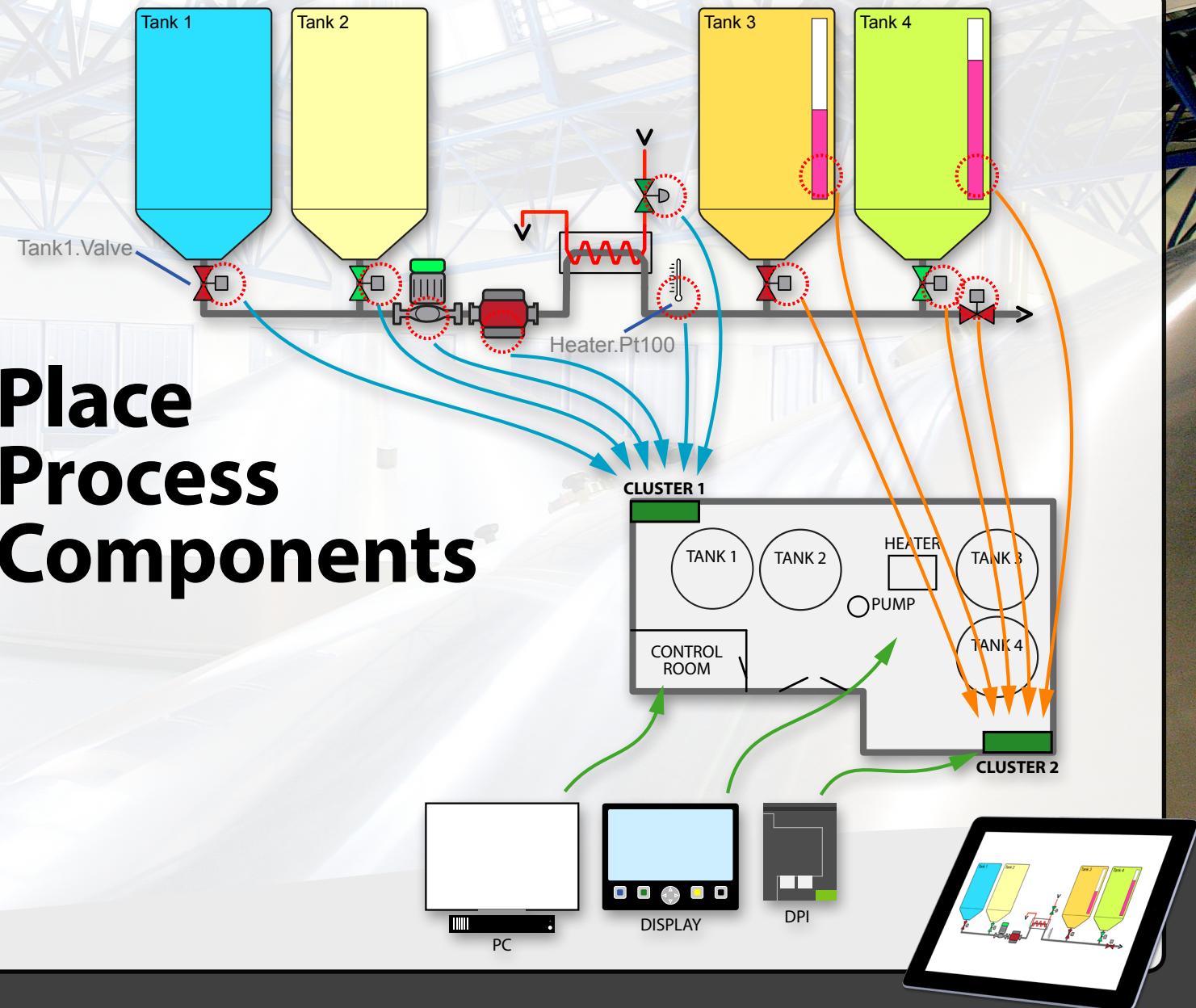
### User interface

At this stage the Process Engineer defines and selects the type and number of Human Machine Interfaces (HMI) required for the project. In this example a PC is located in the control room and a HMI display module is placed in the process room.

### Adding Computing Power

The cluster can be extended with one or more modules providing more computing power, more storage etc. In this example a Distributed Process Intelligence (DPI) module is added to cluster 2.

## Place Process Components





## Automatic creation of cluster and part lists

Lists of hardware modules needed for each cluster are automatically generated and displayed in VIGO6 - virtually located on DIN rails.

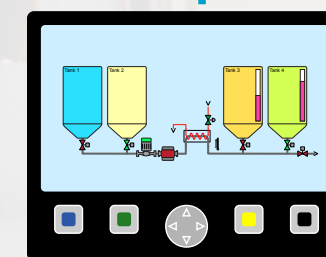
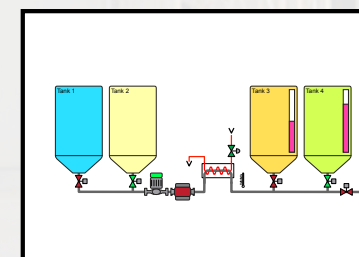
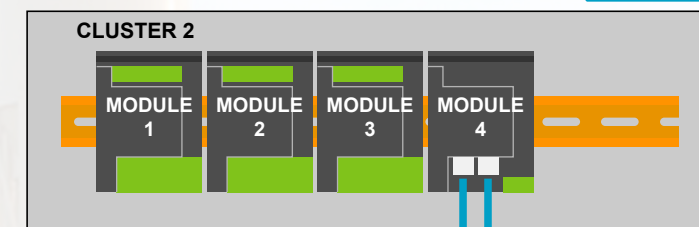
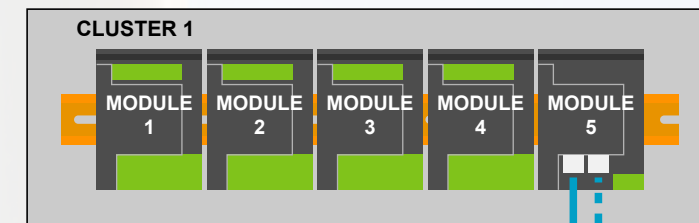
The lists suggests the best suitable hardware configuration and links the process components to the in-/outputs within the I/O modules.

An Ethernet interface module is automatically added to each cluster. The Project Engineer can easily see the types and number of COPP modules required for the project.

After the list is generated, more modules can be added manually and modules can be moved or changed.

COPP modules contain one or more communication interfaces. All COPP modules in VIGO6 are connected to one or more networks.

## Cluster layout and network config.



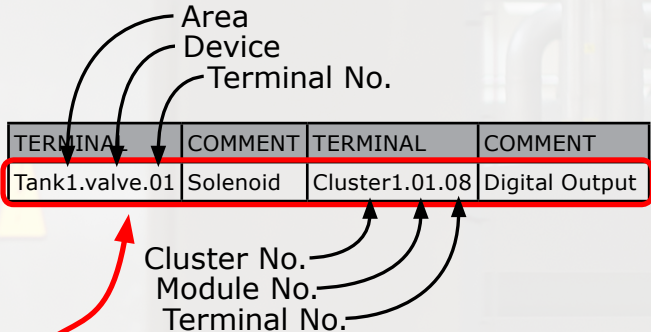
DISPLAY



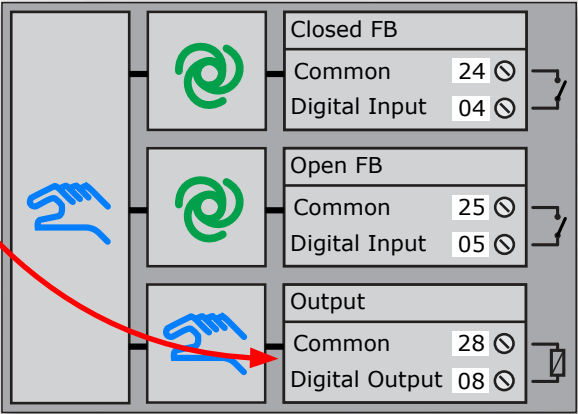


# Creating wiring list

## Wiring list



EXTERNAL EQUIPMENT		MODULES	
TERMINAL	COMMENT	TERMINAL	COMMENT
Tank1.valve.01	Solenoid	Cluster1.01.08	Digital Output
Tank1.valve.02	Solenoid	Cluster1.01.28	Common
Tank1.valve.03	Microswitch FB Closed	Cluster1.01.04	Digital Input
Tank1.valve.04	Microswitch FB Closed	Cluster1.01.24	Common
Tank1.valve.05	Microswitch FB Open	Cluster1.01.05	Digital Input
Tank1.valve.06	Microswitch FB Open	Cluster1.01.25	Common



The designation of terminals is also sent to the modules, enabling the system to show an always up-to-date connection overview for each device. When the electrician has completed the wiring, the modules are ready for download.

The download automatically configures the modules including communication. An I/O test can now be performed.

VIGO6 automatically generates the wiring list. The wiring list is created with the names assigned to each process component by the Process Engineer during the project creation phase.

The COPP modules are designed for one terminal for each wire; this removes the requirement for extra marshalling terminals as typically found to be necessary in many cases.

The device details can contain part number and other essential information.



## Creating the control logic

### Develop and Configure Control Components

Creating the control logic is supported by an archive of control components with predefined visualisation that can be downloaded from PROCES-DATA's public archive.

The components can be used as is, or the Process Engineer can customise components by inheriting from the existing components and change or extend functionality as needed.

Visualisations of both control and process components can be customised and each user interface can be configured to show all or a subset of the total HMI. The visualisations can be applied to PC, display, smartphones and tablets, without any re-programming.

All COPP modules can execute COPP code. Depending on the type, complexity and specific requirements, the control components can be located in one or distributed in a number of COPP modules, such as the powerful HMI display module or a COPP DPI. (Distributed Process Intelligence).

Standard and custom control components can also be located in the I/O modules. I/O modules can work as autonomous stand-alone units providing higher robustness and fast response to critical local signals.

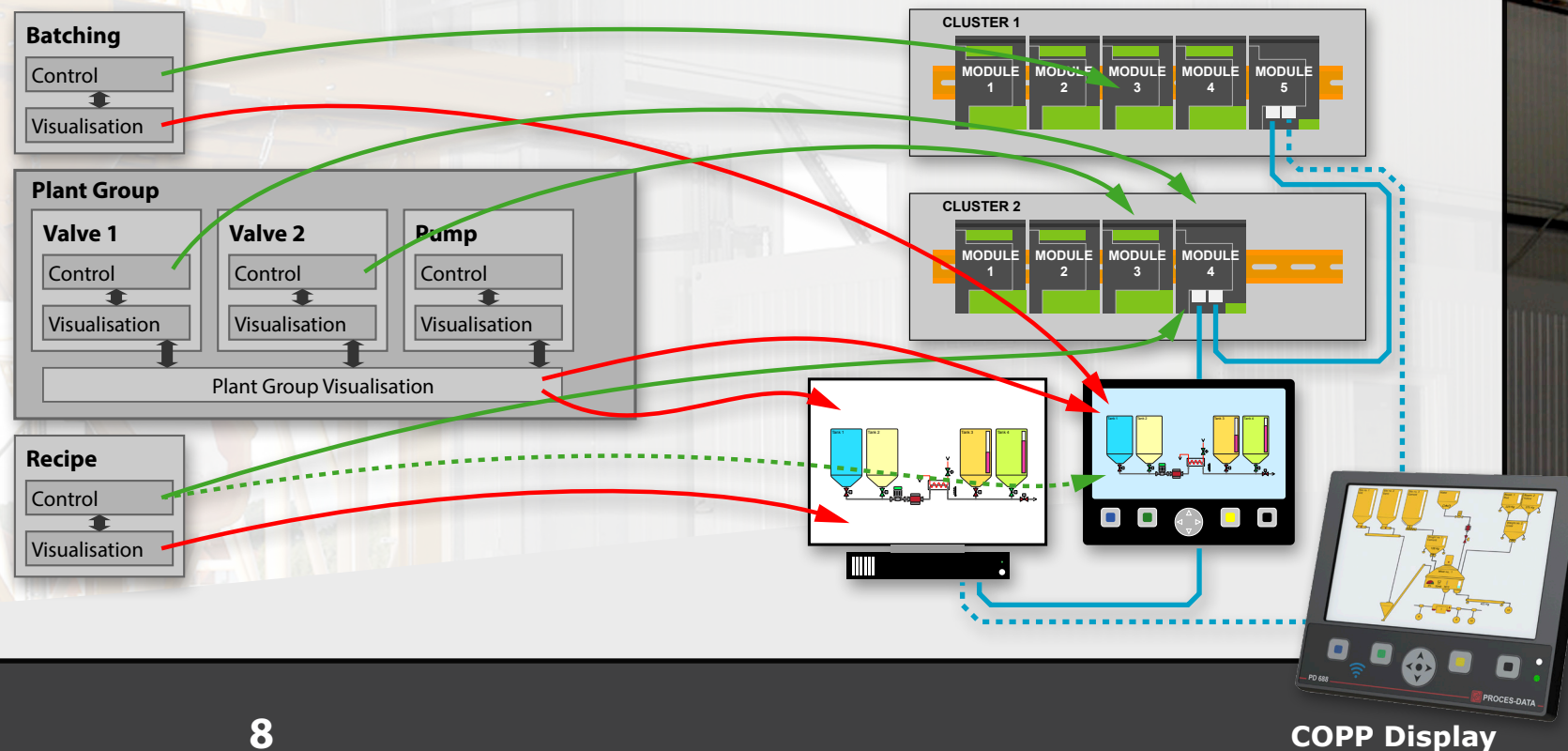
#### Customised components archive

Plant sections can be grouped in assemblies and stored, as a sub plant or even as a complete plant. This grouping enables the Process Engineer to create complete systems by the reuse of pre-stored assemblies or entire plants containing all functionality as originally created.

#### Building and downloading a project

During all steps of a project creation process, the project can be built, simulated and downloaded. A download automatically configures all modules in the project, downloads the program, and performs the required initialisation of data.

Following a complete download, the entire control system is ready to run.





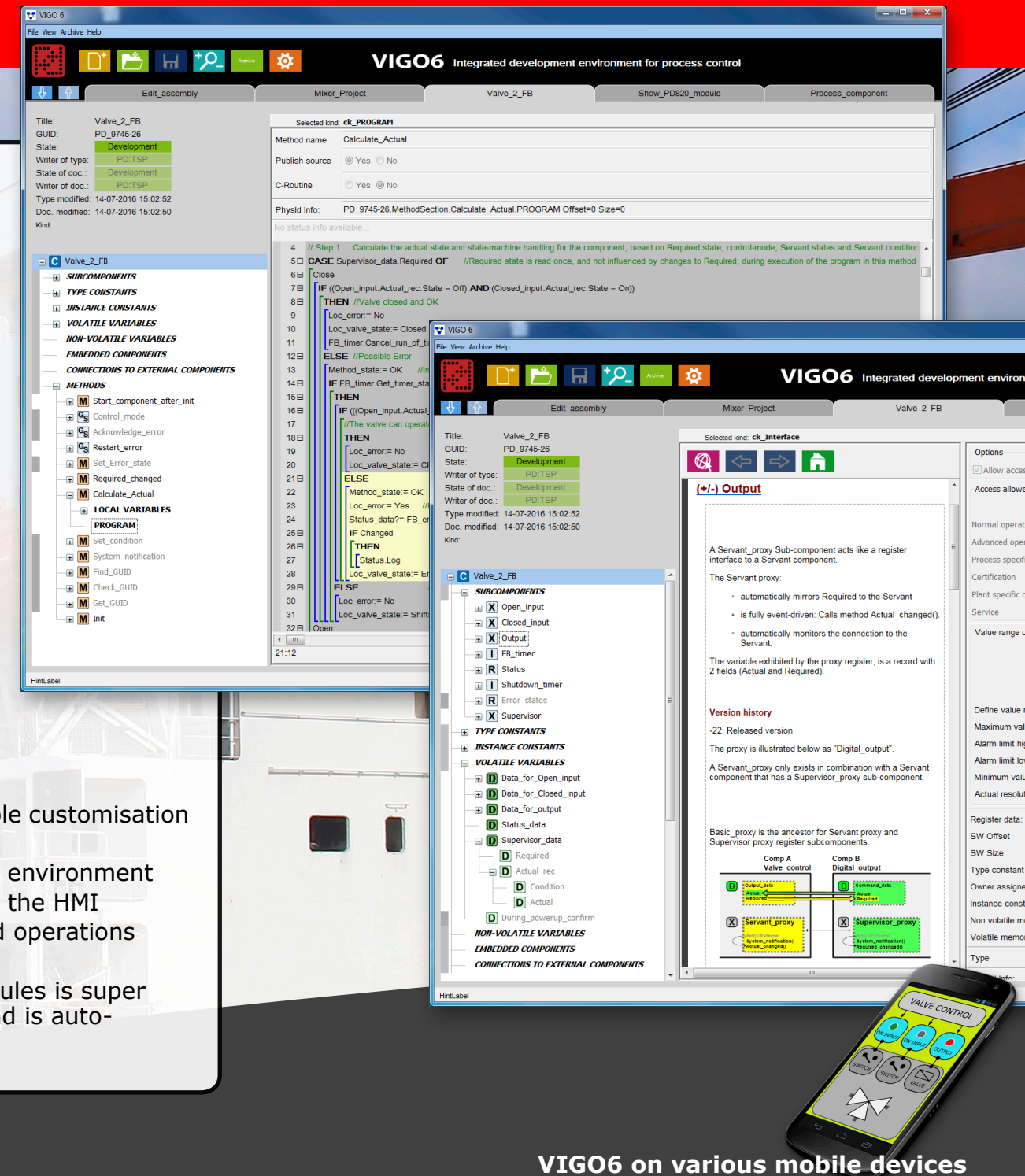
## Development - Component Oriented Process Programming (COPP)

**COPP is used for all programming of logic control, graphical operator interface, supervisory functions etc.**

**The active editor helps and guides the Process Engineer during the programming process. The COPP code in the current component is compiled instantly during creation to provide easier and faster programming. Program code in COPP is similar to IEC 61131-3 Structured Text.**

**COPP is based on object-oriented technology, but specially designed to provide:**

- Simple configuration, less programming
- Faster and safer application development, less errors
- Minimised risk of programming errors, only tested and proven components are used
- Creation of customised COPP components made directly in VIGO6
- Custom components can inherit from an existing component available in the archive
- Object oriented principle supports inheritance of functionality and related graphics for simple customisation
- Integrated documentation ensures instant assistance when utilising archive components
- Component archive with full access and version control, enabling multi-user programming environment
- Integrated multi language support, allowing the operator to switch language on-the-fly on the HMI
- Integrated user access control. Operator login-rights defines access to data, graphics, and operations
- SI units, with automatic conversion to local units
- All data is tagged with quality information. The communication between all hardware modules is supervised and all data include data quality information. Fault information is part of the data and is automatically transferred via P-NET fieldbus





# COPP Modules

Designed for highly distributed applications, the intelligent DIN mounted COPP modules can be located where best suited to the project; In the control room or remotely distributed close to process units.

- Compact design for easy installation, fewer and smaller control panels offers significantly lower material-, installation- and maintenance costs
- Intelligent terminal block enables direct connection of external signals, without the requirement of extra marshalling terminations and offers significantly lower installation costs



DPI  
PD 802



DPI GSM-GPS  
PD 803



Multifunction  
PD 850



Digital I/O  
PD 820



Digital In  
PD 821



Analogue I/O  
PD 840



Motor Controller  
PD 870



Analogue I/O  
and HART  
PD 644



COPP Gateway  
PD 610



Display Module  
PD 688



GPS Module  
PD 947



Flowtransmitter





# Advantages with VIGO6 & COPP

**One single tool covers all steps of automation, system layout, hardware, wiring list, I/O- testing, control logic, simulation, HMI, data logging, etc. for any project.**

- A single programming language (COPP) is used for all programming of logic control, visualization, graphical operator interface, supervisory functions etc.
- Component archive with full access and version control, enabling multi-user programming environment
- Comprehensive archives of tested process and control components and easy reuse of software components reduces the engineering time significantly
- Object oriented principle supports inheritance of functionality and related visualisation for simple customisation
- Integrated documentation ensures instant assistance when utilising archive components
- The context sensitive editor assists the Process Engineer and makes it simple to do even advanced control logic
- Grouping of process sections including related visualisation into reusable components
- The advanced simulation mode allows programs to be tested and verified without the need of hardware, which reduces the need for on-site testing
- Automatic unit verification avoiding quantity errors
- Automatic conversion to/from local units in editor and on HMI
- COPP is based on event-driven program executions which:
  - Reduces the load on the CPU to a minimum
  - Minimises the need for polling I/O
  - Reduces traffic on the P-NET Fieldbus
  - Secures fast response to critical control
- Data is tagged with quality information, allowing the control logic to validate data
- Operator login-rights defines access to data, visualisation, and operations
- Integrated multi language support, allowing the operator to switch language on-the-fly on the HMI
- Distributed control reduces the influence of a malfunction to a limited area, letting the remaining plant continue working
- COPP enabled I/O modules ensure fast response
- VIGO6 and COPP is ideal for all OEMs who want to protect the know-how implemented in their system, as programs cannot be uploaded nor changed by a third party

**The complete integrated software and hardware suite for automation projects**



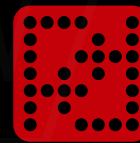
**COPP I/O Module**





P-NET

www.VIGO6.com



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