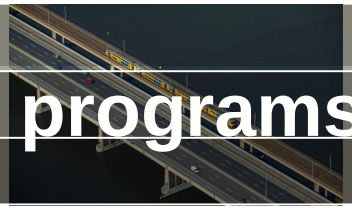

WANDA
Deltares
Wanda WEC - OpenMI

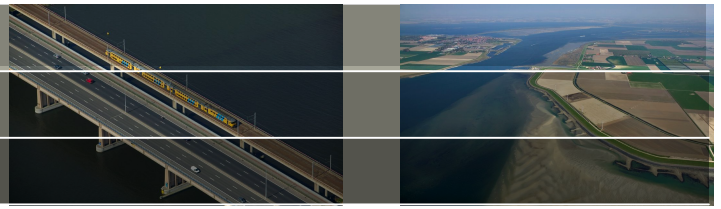
# Wanda 4  coupling to external programs



Two options:

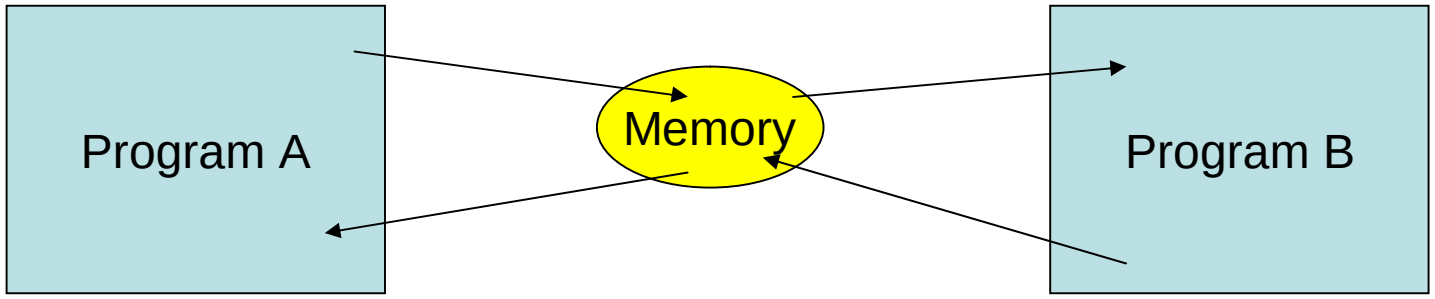
- Wanda External Communication  (WEC – since 2005)
- Open Modelling Interface standaard  (OpenMI – since 2009)

# WEC

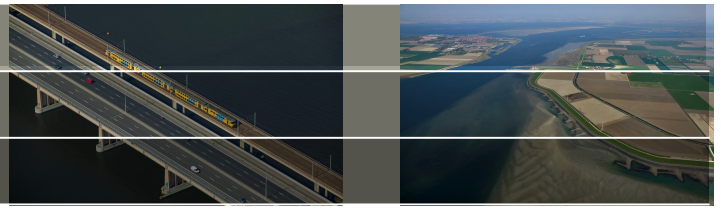


WEC = Wanda External Communication

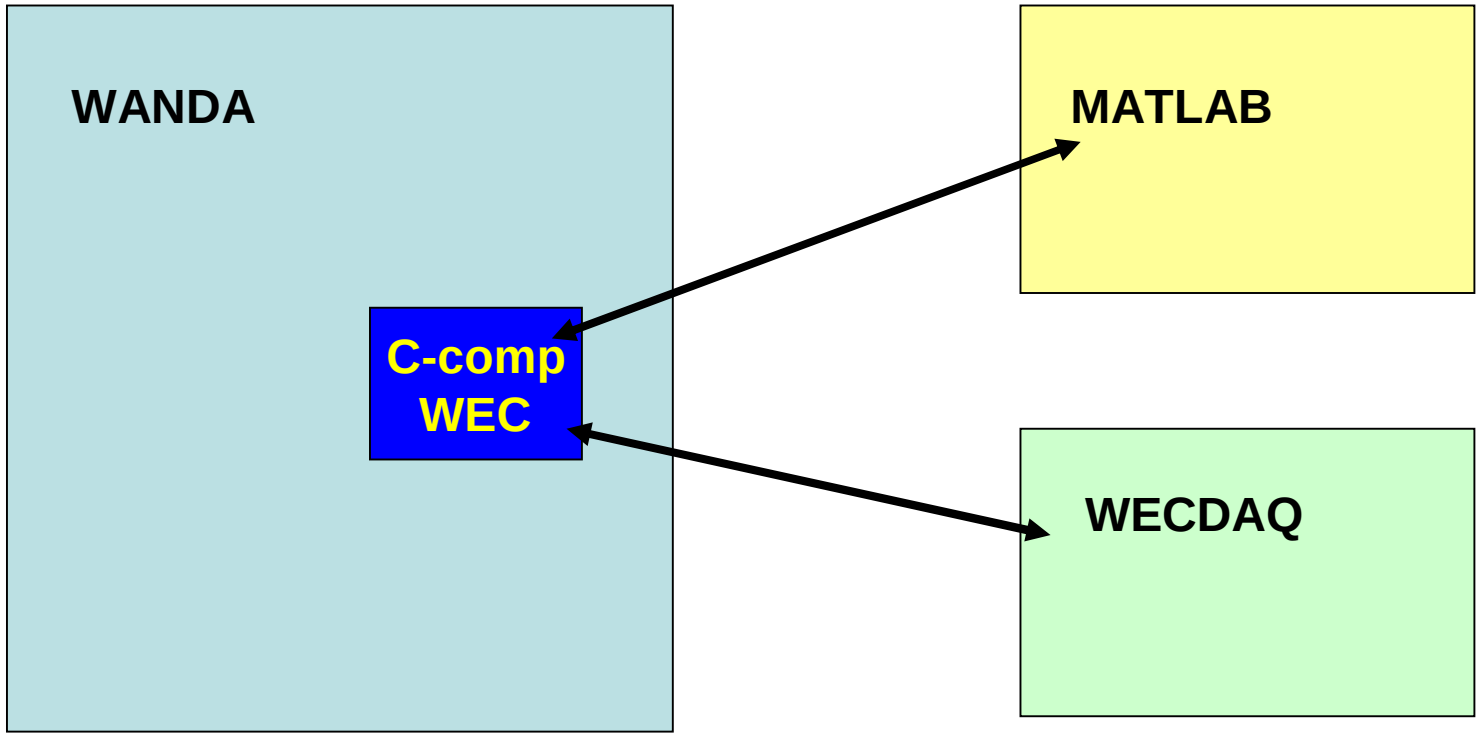
Exchange of data sets between 2 active programs using shared memory



# WEC



2 different applications:



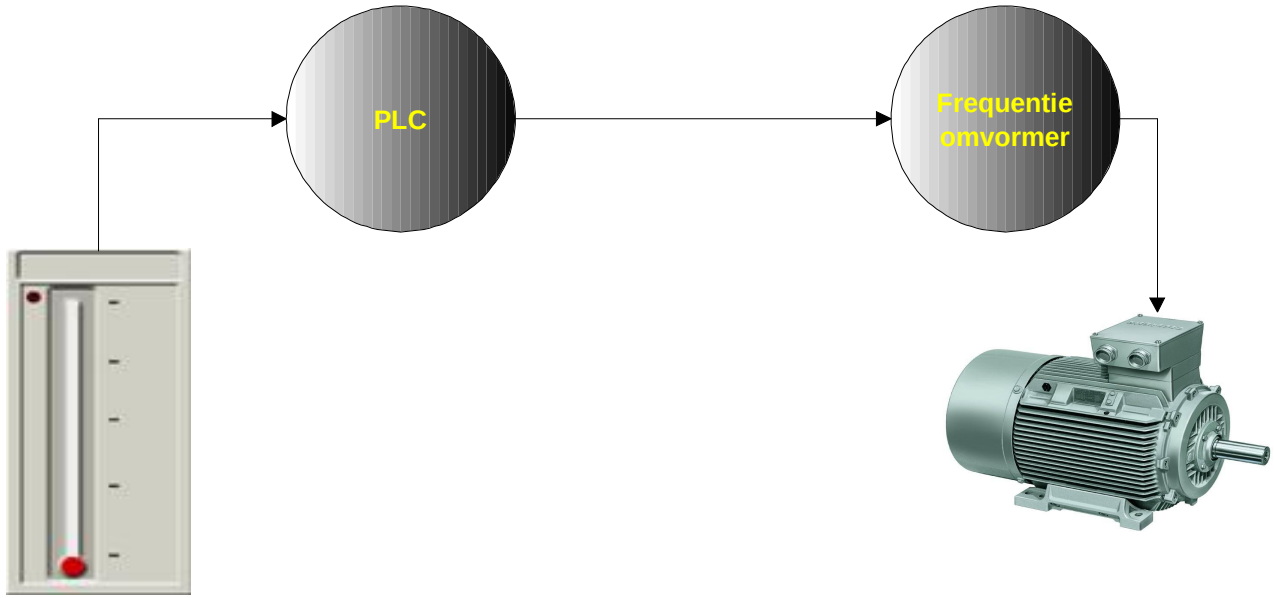

Communication by special control components WEC

# Pumping station simulator

Goal of pumping station simulator:

Set PLC by means of digital water

**Principe gemaalbesturing**

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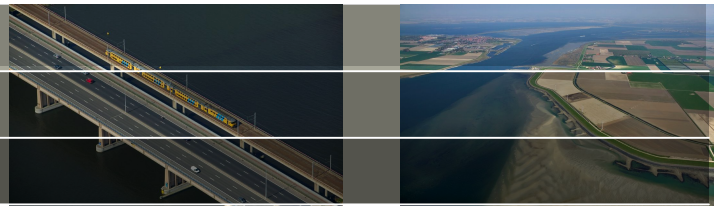
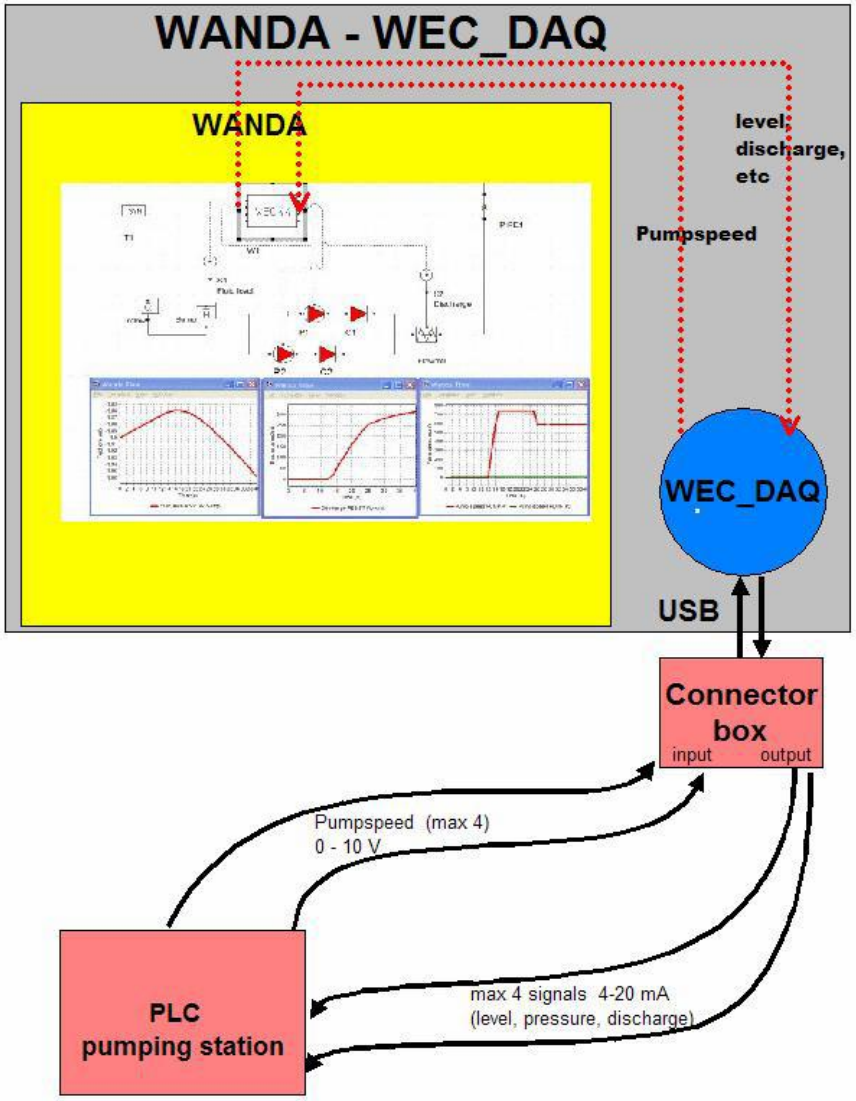
# Pumping station simulator



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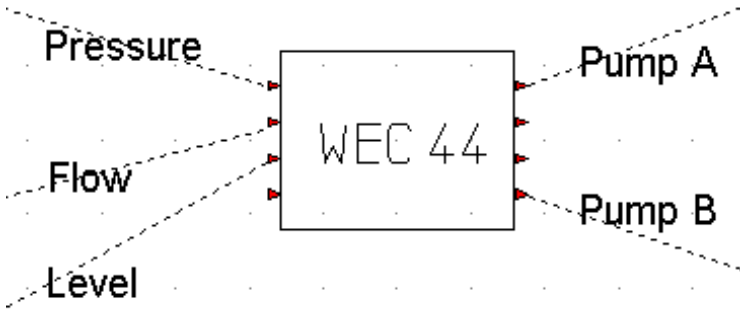
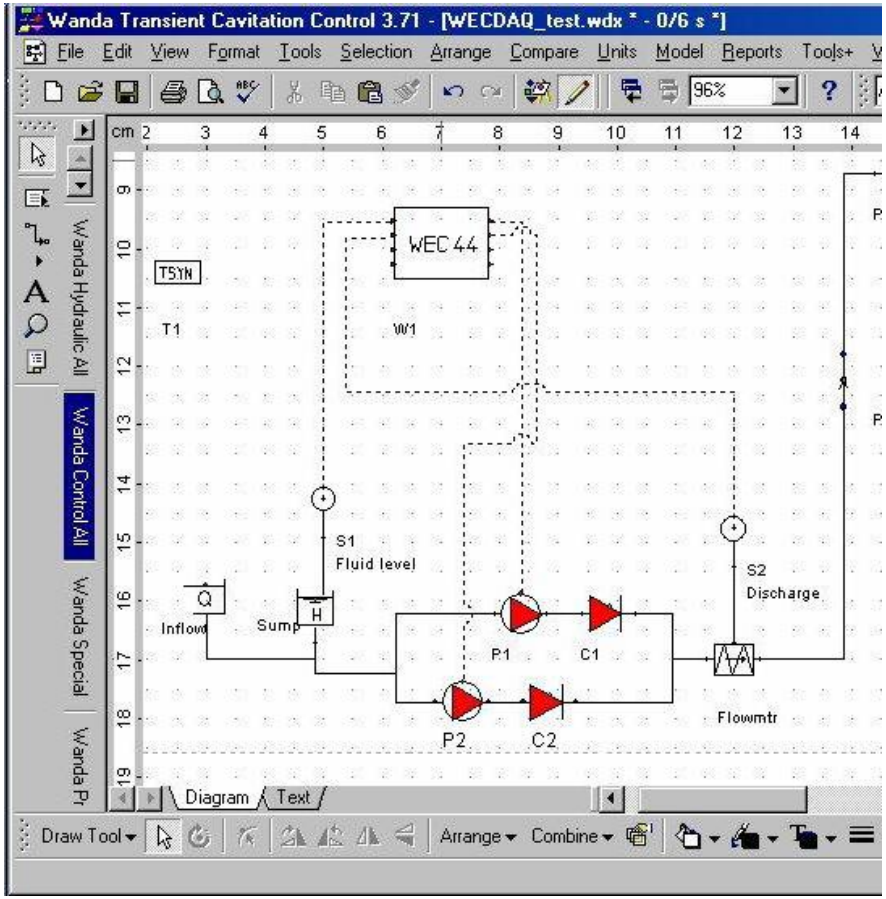
# Pumping station simulator

Wanda scheme:

Control component
WEC
(several types
In/Out channels max 8)

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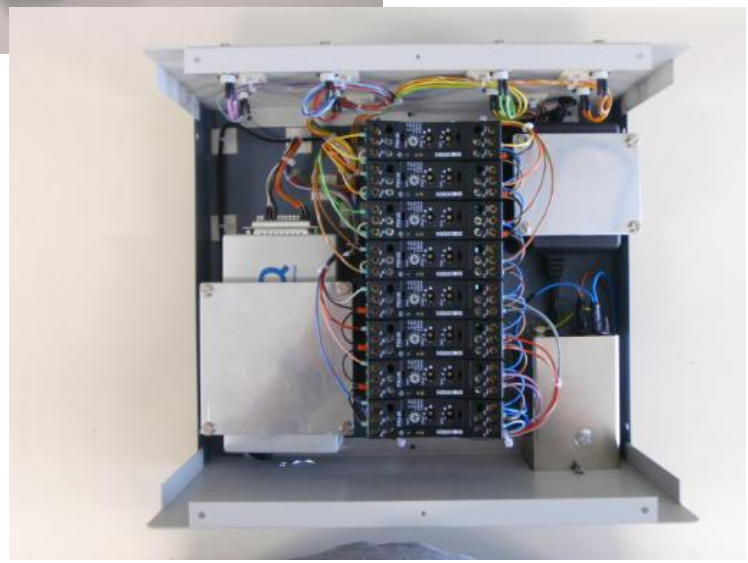
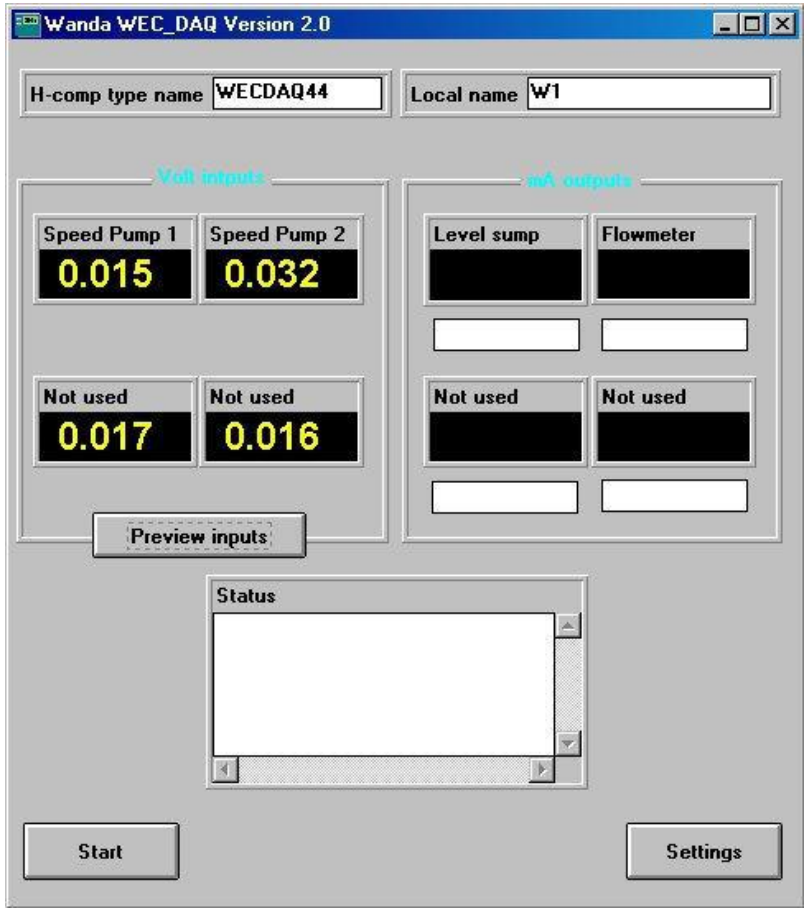
# Pumping station simulator

WECDAQ  hardware en software



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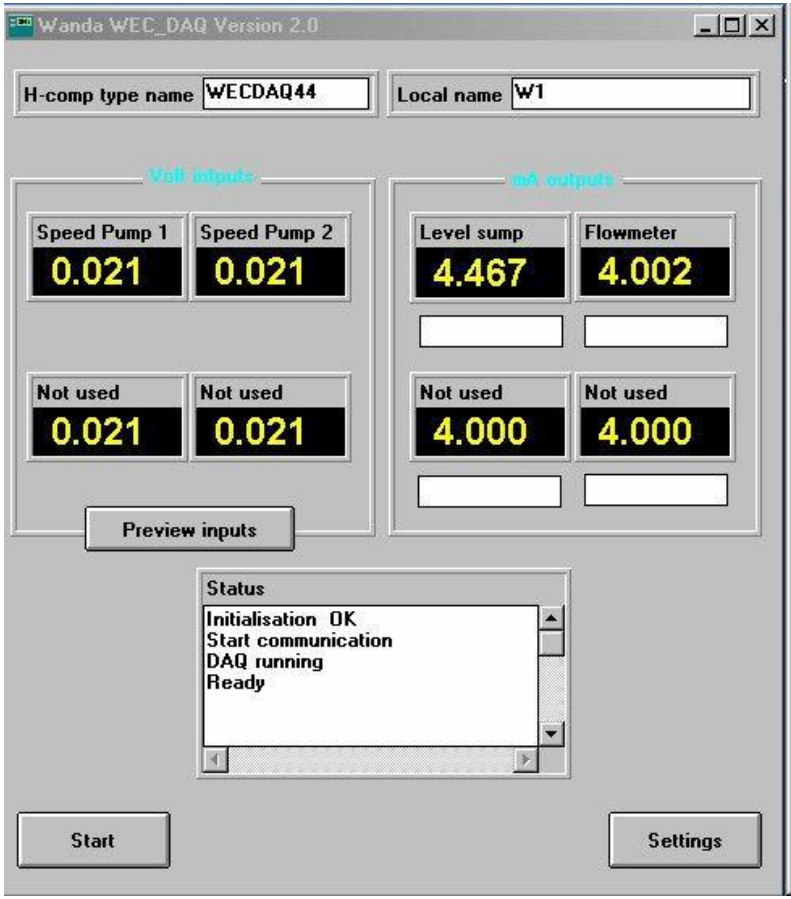
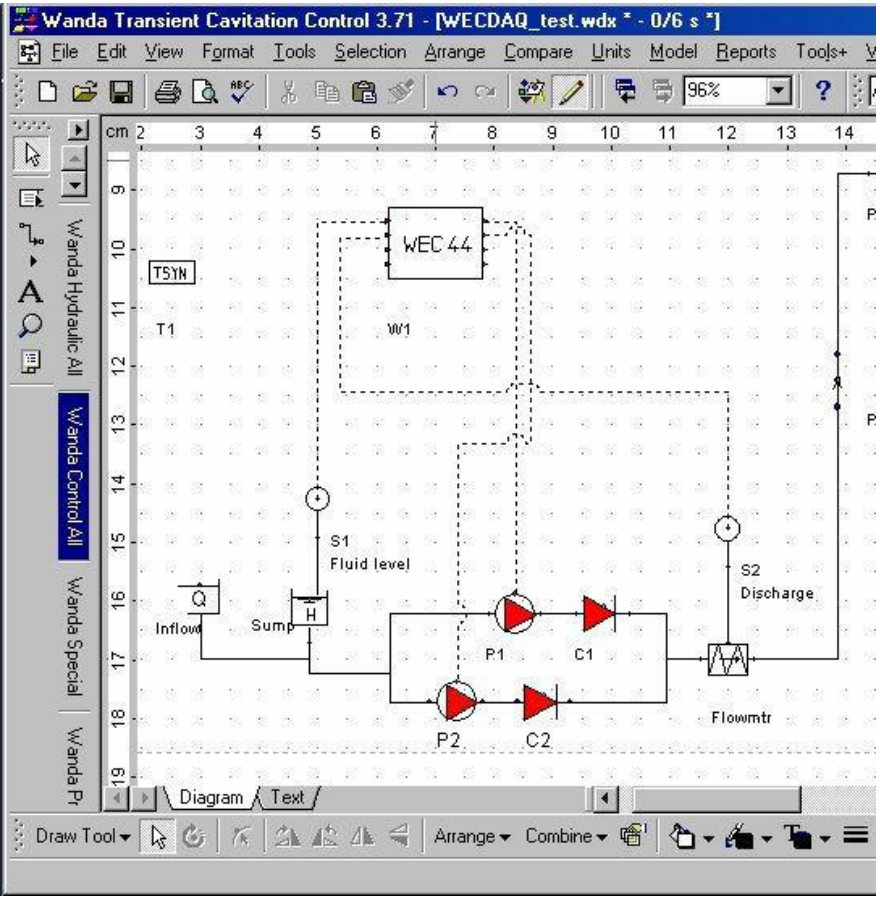
# Pumping station simulator

Demonstration

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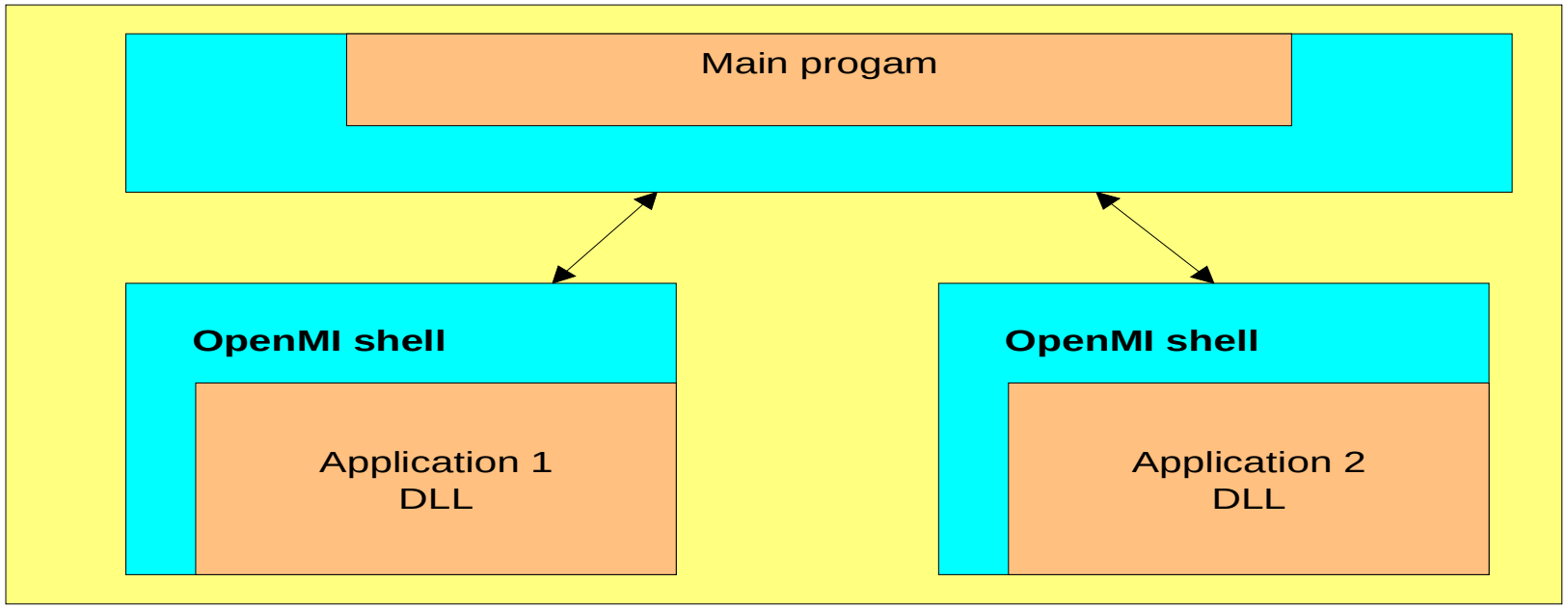
# OpenMI

Open Modelling Interface:

- Standard that simplifies coupling of numerical models.
- Clear specification of which variables can be exchanged at what geometrical location (position) within which time domain.

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# OpenMI

Open Modelling Interface:

- Standard that simplifies coupling of numerical models.
- Clear specification of which variables can be exchanged at what geometrical location (position) within which time domain.

  - Output of model A serves as input for model B (and vice versa).
  - The data exchange takes place at a model-time-step-basis, after which time and/or place are interpolated.
  - Two or more OpenMI-compliant models can easily be combined into a integrated model calculation.

# OpenMI

Example .NET code:

```
ILinkableComponent wandaModel = new WandaEngine();
        wandaModel.Initialize(initializationArguments);

        IInput myPumpInputItem = wandaModel.InputItems[0];
        IOutput myDischargeOutputItem = wandaModel.OutputItems[0];

        while ( ! (wandaModel.Status == LinkableComponentStatus.Done) )
        {
            myPumpInputItem.Values[0] = newPumpValue;

            wandaModel.Update();

            updatedDischargeValue = myDischargeOutputItem[0];
        }
```

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# OpenMI

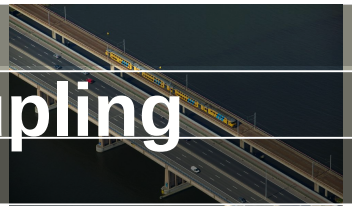
Open Modelling Interface: Open source code .NET

Joint development of:


More information:

WWW.OPENMI.ORG

# OpenMI - Sobek – Wanda coupling



Polder pumping station draining away to tidal water

Goal: saving energy pumping station – no pumping during HW

Question: what is the effect on the polder system?

Sobek: 1D modeling of polder system

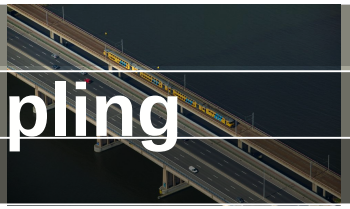
no pump model with power/efficiency

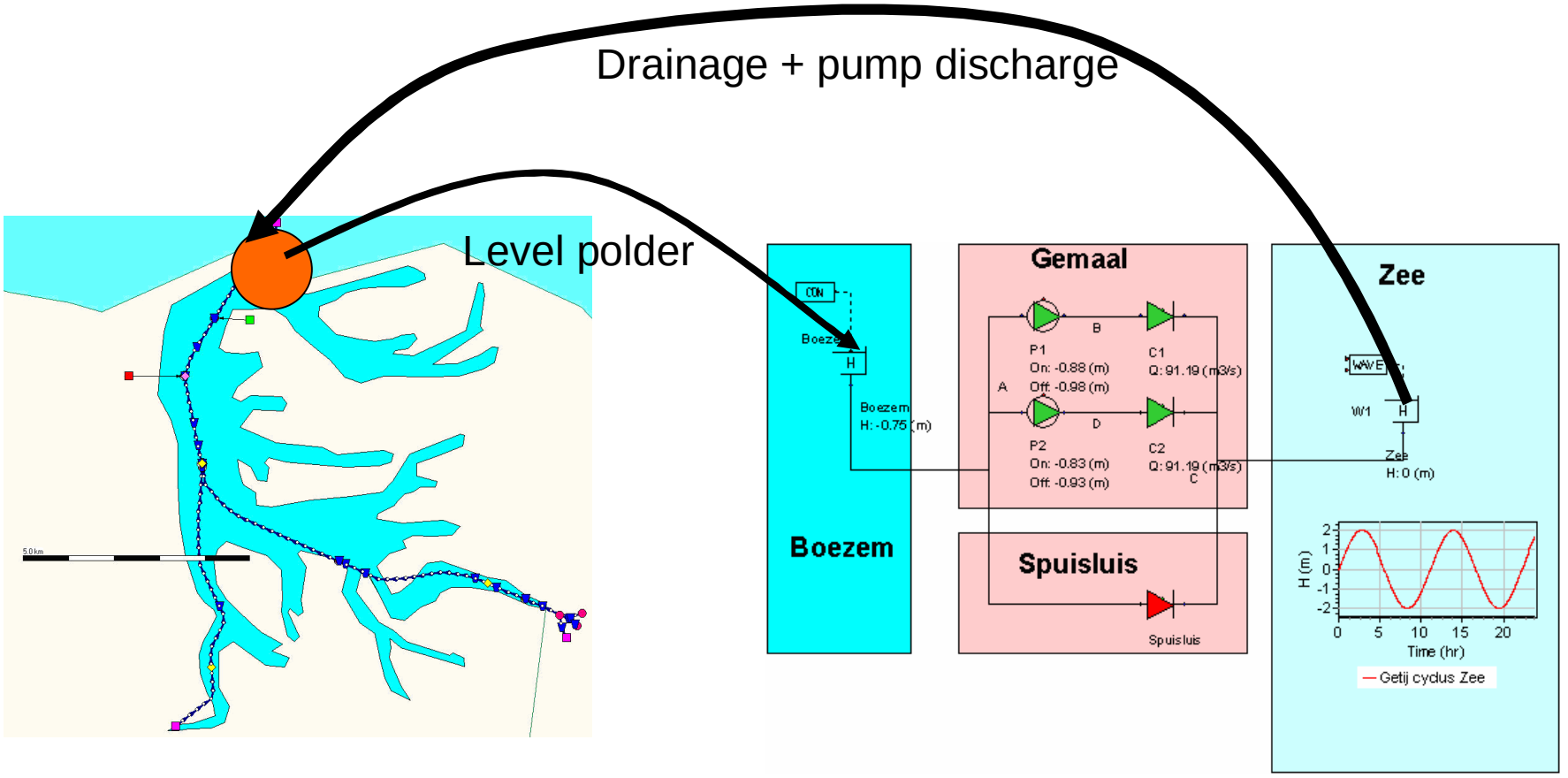
WANDA: sound pump model including energy calculation

not suitable for modeling a polder system

SOLUTION: couple them

# OpenMI - Sobek – Wanda coupling



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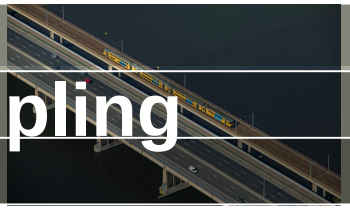
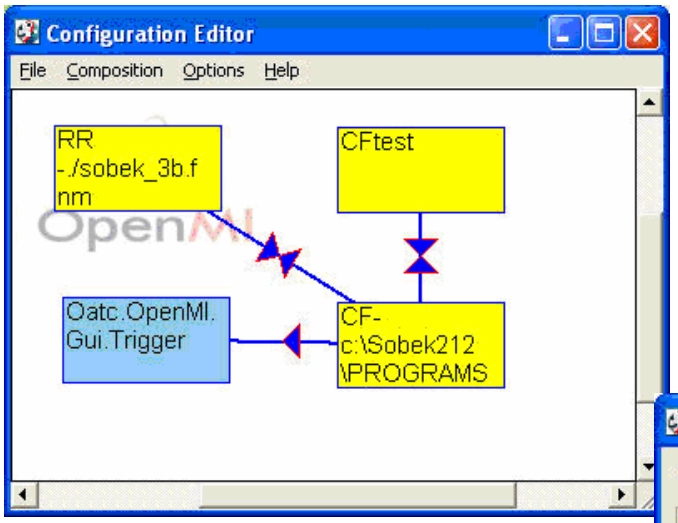
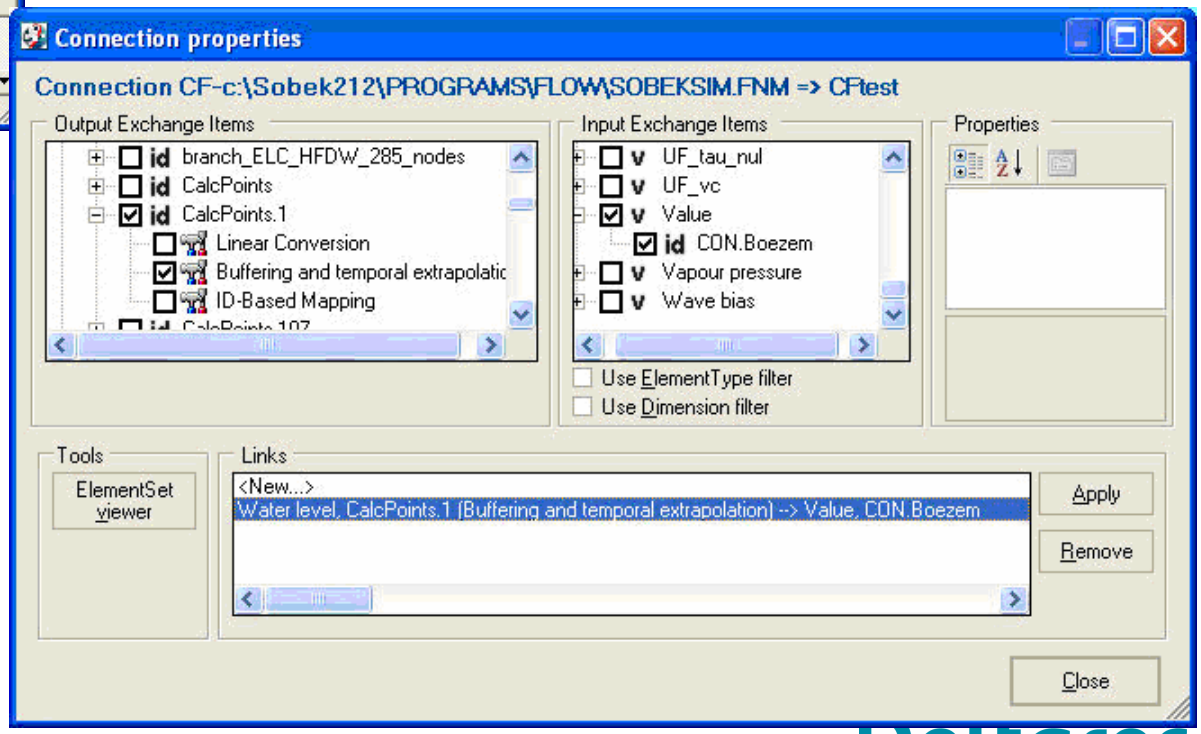
# OpenMI - Sobek – Wanda coupling



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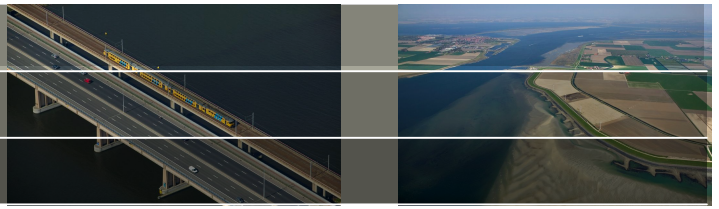
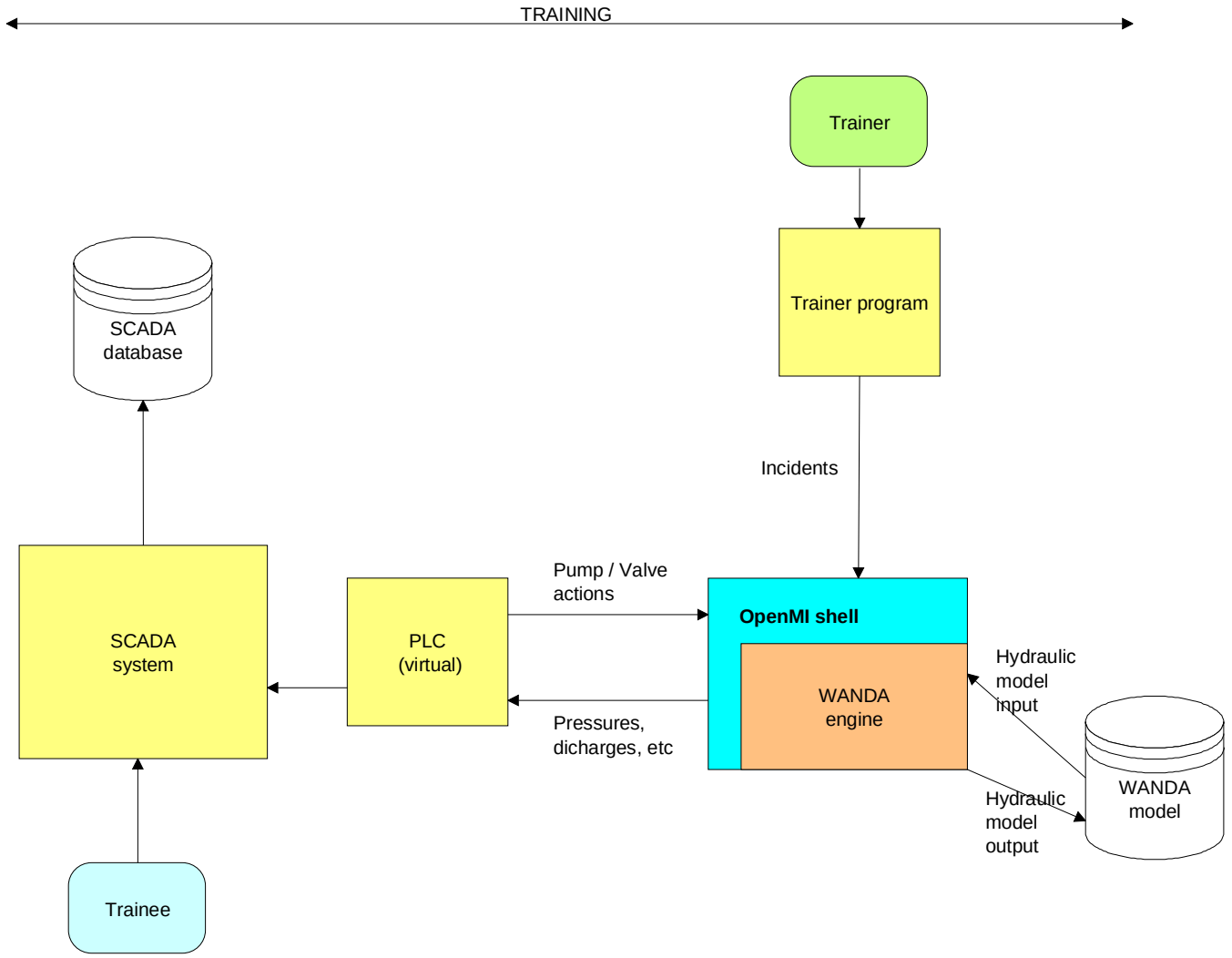
# OpenMI – Trainings simulator



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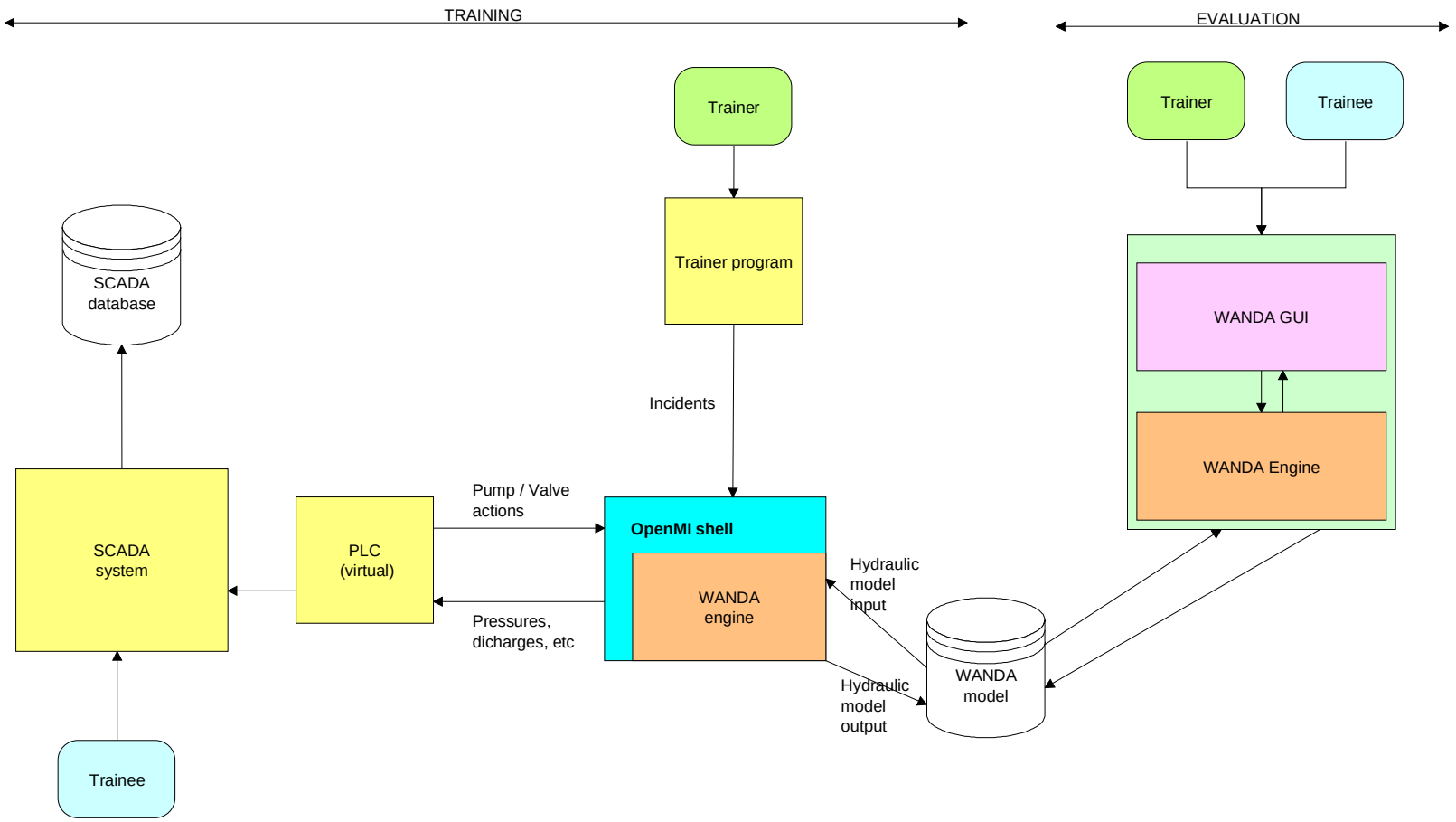


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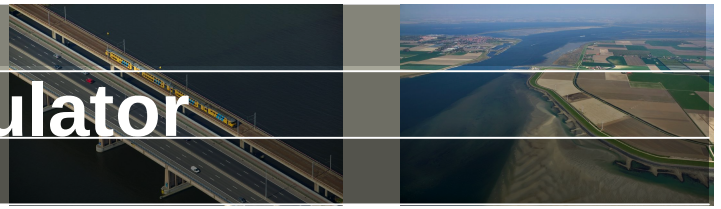
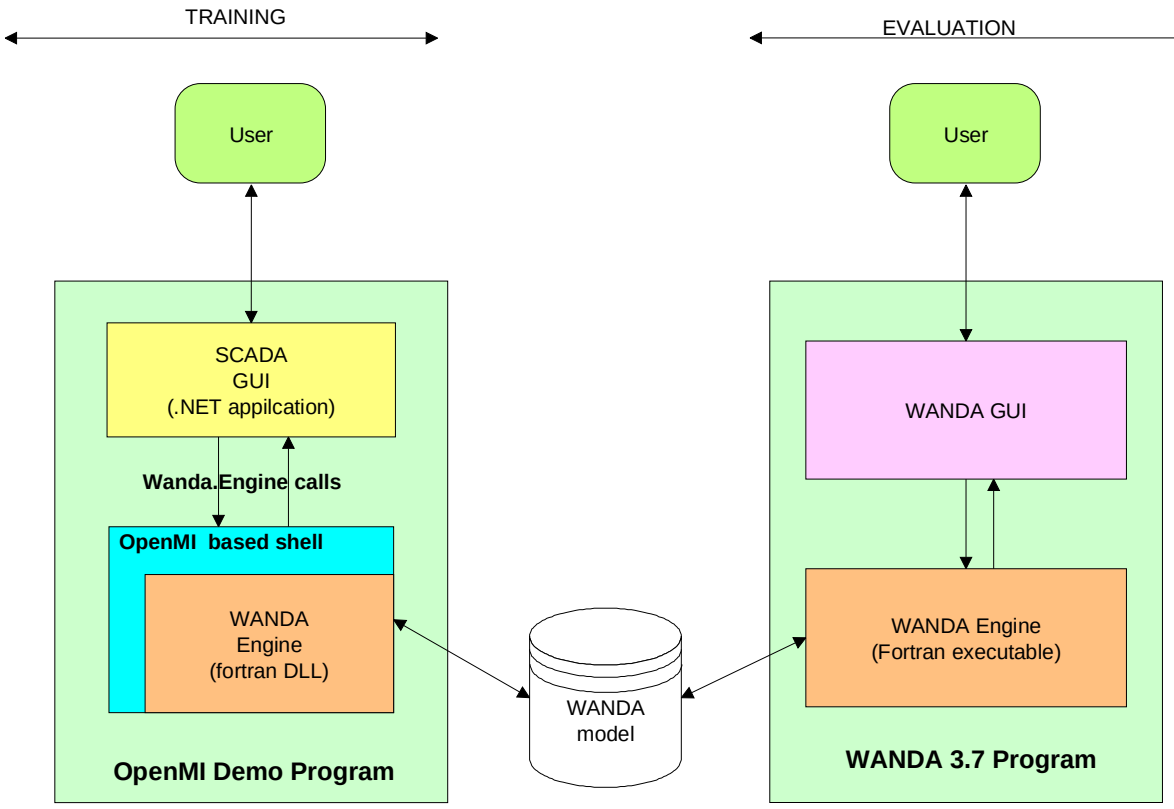
# OpenMI – demo trainings simulator



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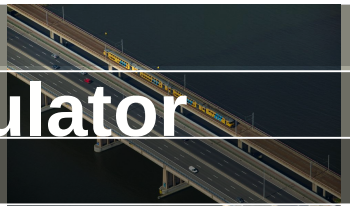

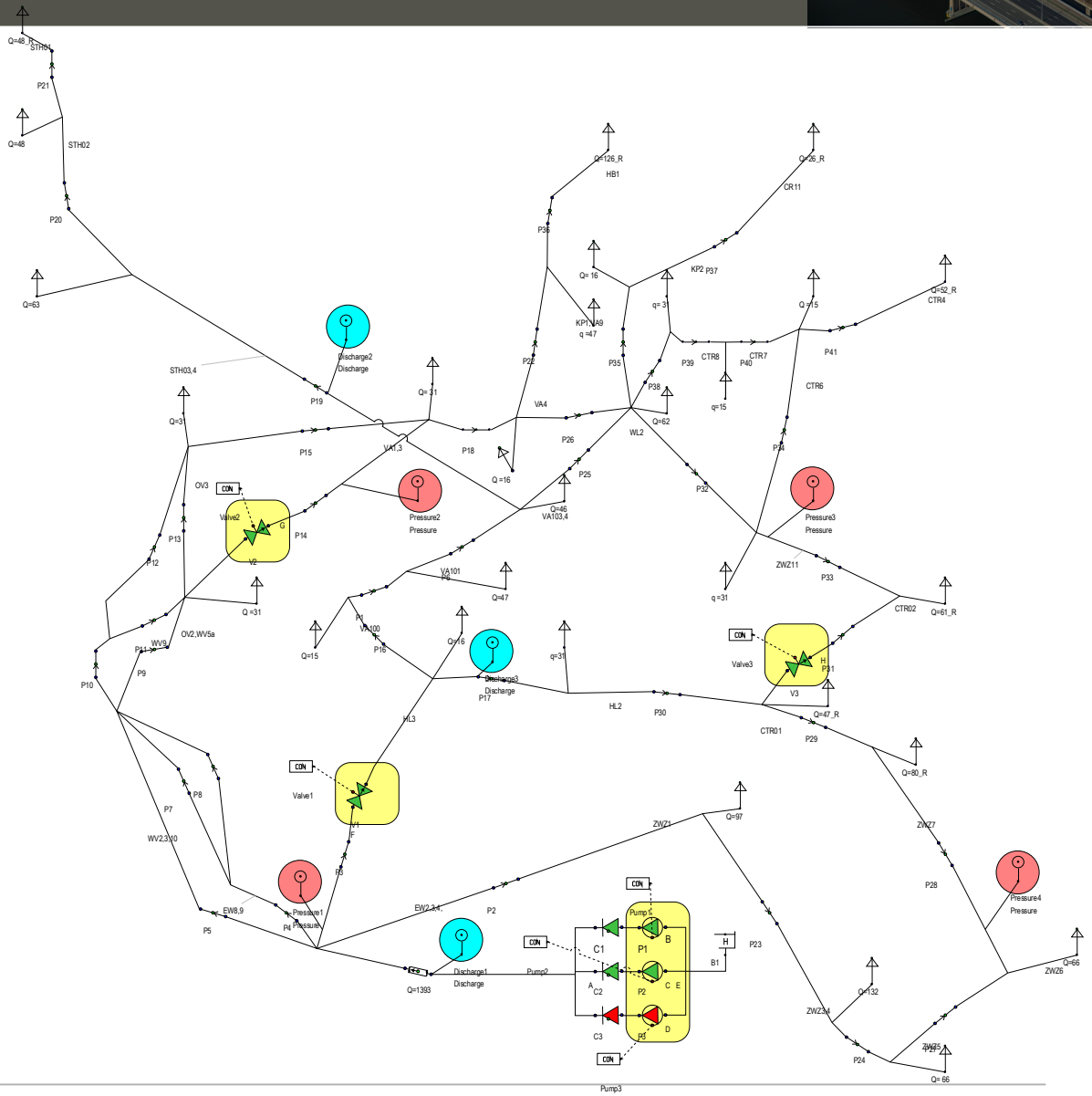


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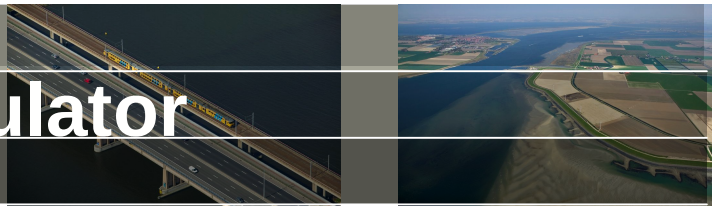


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