# FERMA

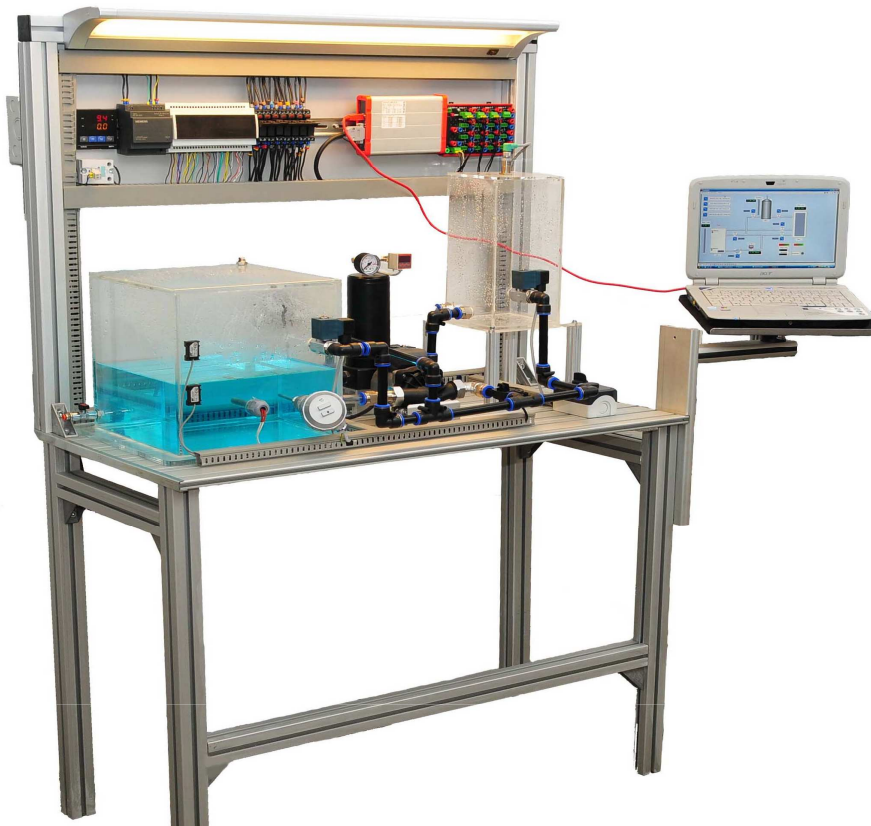**PROCESS AUTOMATION TRAINING SET (FQ-DA)**



The process automation training set allows the learner to enable different flows from the main tank to others and back. The learner can change the temperature, pressure and the flow of the fluid. The control is done through a PC connected to the system. The learner can observe in realtime what happens when the setup is changed. Moreover, the process is recorded at the same time through data acqisition on the PC.

The Process Automation Training Set helps the learner how to deal with fluids.

The system consists of:
- Fluid tanks
- Pump
- Fluid accumulator
- Actuators
- Fluid level measurement
- Fluid pressure measurement
- Flow measurement
- Temperature measurement
- Heating unit with control panel
- PC controlled operation
- I/O card
- Data Acquisition
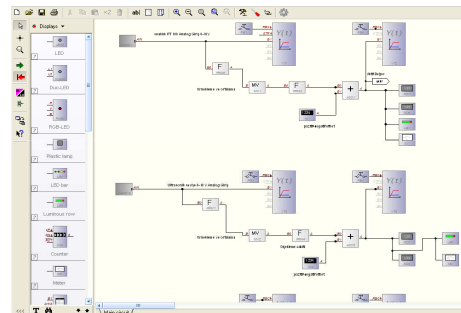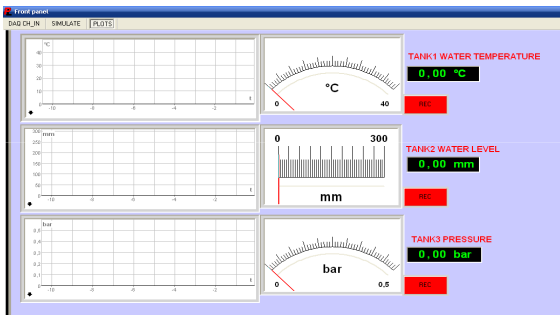- Scada
- Software and Documentation
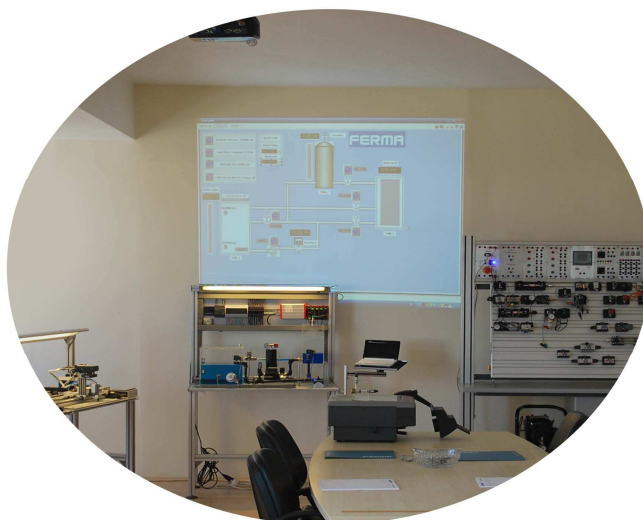
The control and scada software helps users, to be able create an easy setup and control algorithms. Besides, students can visualise the system via an user friendly scada.

Students can create scenarios as they want. Defaults are;
- By-pass test
- Tank 2 epmtying
- Pressure test
- Define tank 2 level
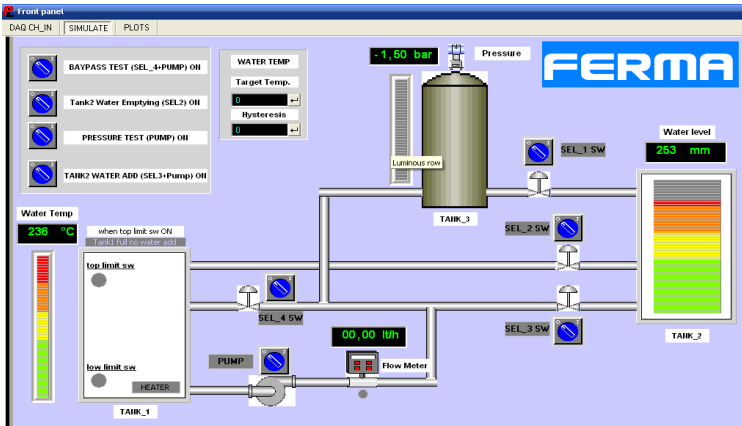
There are also  online watch windows, and graphic drawing properties, variables (Pressure, level, temperature, flow) versus time.



Available experiments, which can be applied with the sets are;

- Basic programming and understanding of a process flow chart
- Learning the use of Data Acquisition Cards and communication with a PC
- Scada software programming to visualise a real mini industrial process.
- PID Control algorithm creation with PC software
- Comparison of industrial PID temperature controllor behaviour which is built in the system, and the students algorithms written by PC software
- Fluid flow measurement with a pulse type flow sensor
- Pressure measurement via a digital pressure sensor and a mechanical manometer
- Fluid level control of a tank and calculation of the volume with related the height
- By-pass system control
- Arrange the related solenoid valves according to the necessary scenario
- Setup and piping of fluid systems, pipes can be installed easily by quick connections
- Understanding the sensor characteristics, as
    - Ultrasonic level measurement sensor
    - Digital pressure transmitter with LCD
    - Mechanical pressure manometer to compare with digital one
    - Pulse type flow measurement sensor
    - Analog temperature sensor
    - Capasitive limit switches, for tank 1 level control