

Instructor's Interface

Different users of a training simulator have different views on the simulation model, and one important view is given by the user interface of the instructor. During training, this is the view through which the simulation is controlled, including start-up and shutdown of the entire simulation system and running simulation-based training programs. Primary requirements of the instructor's interface are ease of use and ease of configuration to meet the demands of different training simulators.

APROS provides a tool called the Instructor's interface as a basis for the instructor's tools. It consists of 5 main windows separated in 3 executables. The look and feel as well as the functionality can be extensively modified by configuration without programming, hence Instructor's interface can be used in various training simulators. The configuration can be edited using the graphical tools of the environment, or, as the configuration is stored in XML format, any XML or text editor.

The communication between the simulator and the Instructor's interface is based on OPC (OLE for Process Control) and custom DCOM (Distributed Component Object Model) interfaces. OPC is used to transfer the numerical values and other DCOM interfaces to give commands to the simulator.

Main

The Main window is opened when the instructor is ready to start the training. It provides an access to control and monitor the course of the training session. E.g. following functionality is available

- start predefined training programs
- execute predefined scripts
- control the course of the training session (start, stop etc)
- open other tools like Action log and Save
- change and monitor the simulation speed
- monitor the progress of the simulation (current speed, number of iterations and time step)
- view information about the loaded Training Program

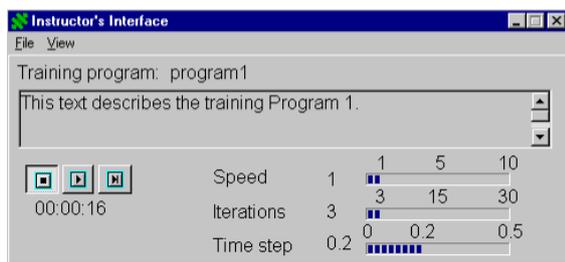


Figure 1 Instructor's interface main window

Malfunction

The Malfunction window is used to monitor and initiate process and automation equipment malfunctions and events. Through this window, the Instructor can

- change and view the status of the malfunction. The status can be passive, active or triggered
- edit the trigger conditions of the malfunction
- browse the malfunctions through tree view
- view the description of the malfunction

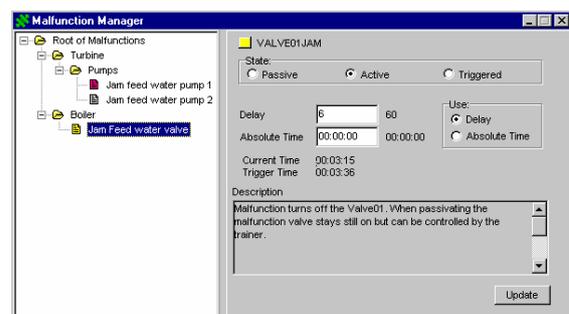


Figure 2 Malfunction window.

The Malfunction window is a separate tool, which can be used without other parts of the Instructor's interface.

Save

The Save Window is used for controlling the saving and loading of simulator initial states, and the recording of the simulation run by autosaving.

The instructor can enter autosaving parameters including the saving frequency and the file name used. The instructor can also rewind the training session and after rewind either restart from the moment or replay the training session.

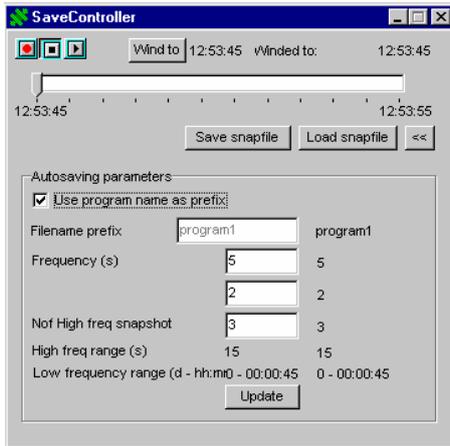


Figure 3 Save window.

Trend

The Trend Window shows predefined variables as curves. This tool alongside with the normal operator displays helps the instructor to follow the course of the training session.

The number of trend variables is unlimited and they can be arranged into folders and groups. The Trend window is a separate tool, which can be used without other parts of the Instructor's interface.

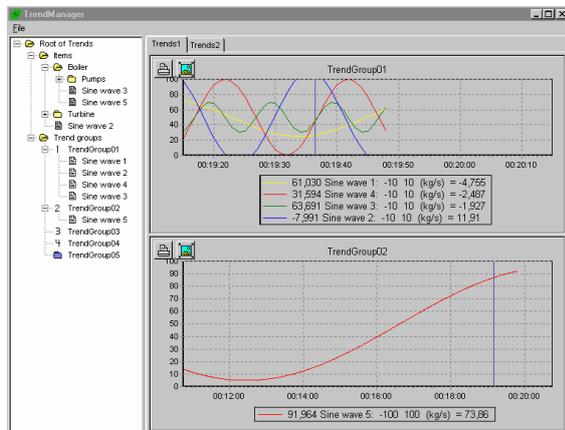


Figure 4 Trend window

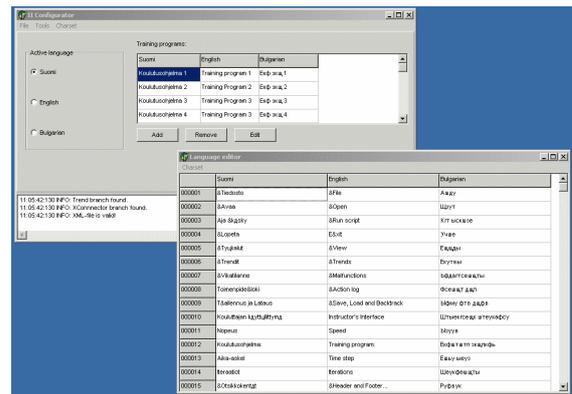


Figure 5 Instructor's interface configuration tool

Configuration tool

The configuration of the Instructor's interface can be edited using a graphical tool designed for this purpose. And as the configuration is stored in XML format, also XML or ASCII editors can be used.

Through the Configuration tool, one can add training programs to the system and to edit the texts visible in the Instructor's interface windows. A new language even with a different character set can be added and all texts visible can be written in the language.

Other configurable features include:

- start-up order and parameters of different parts of the training simulator system
- availability of tools for the user: Action log, Trend etc
- trend and malfunction definitions

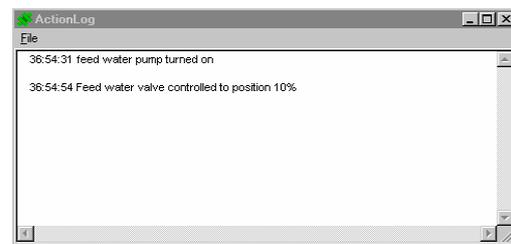


Figure 6 Action log window

Action log

The Action Log window is used for monitoring and printing all actions conducted by the trainees and the instructor.

When an action log event occurs, the corresponding description text is written on the window together with a time stamp.