Stand Automation for Processes Simulation Occurring in Oil Wells

Overview

The processes simulation stand automation system is intended to create the most reproducible, as well as flexible regulated and precisely maintained conditions for conducting in an automatic mode experiments to study the noise of fluid filtration through a porous medium going on oil wells.

The automation system is designed on the basis of the control and measurement equipment of National Instruments.

A special signal conditioning NTCB-01 connector block was developed which provides communication between the data acquisition boards and external devices.



System Features

- Registration of acoustic signals which arise out during fluid movement through a porous medium and their recording in an audio file of the .wav format
- Measurement and control of the fluid injected temperature
- Setting and maintenance of various pressure/flow modes for fluids/gas used
- Pressure distribution to the test samples according to the given algorithm
- Data acquisition from sensors and generation of control signals to the plant actuating mechanisms according to the given algorithm
- Automatic pressure release and activation of the alarm in the event of abnormal situations on the stand

Software Features

- Plant operation in automatic or manual mode
- Plant parameter setting as also algorithm of plant management
- Automatic control of the plant's actuating mechanisms according to the to the given control algorithm
- Generation of analog signals of various shapes and amplitudes
- Measured parameters visualization in graphical and numerical form
- Automatic plant shutdown in the event of abnormal situations and alarm initiation









