



# Software for fatigue test

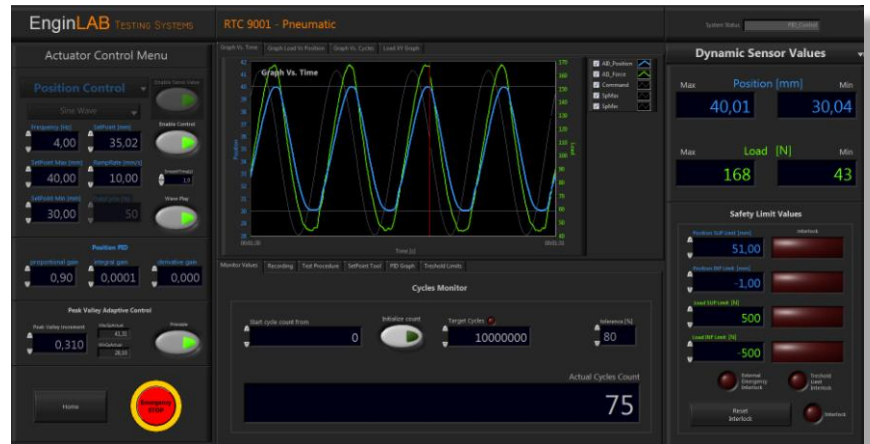
*The RTC-9001 Pneumatic is designed and optimized to perform static and fatigue test with cost effective servo-pneumatic actuators*

EnginLAB released the RTC-9001 Pneumatic: the user interface software for the electronic RTC-9001. The software is designed keeping in mind the need for laboratories and industries to easily perform static and fatigue test with a very powerful and cost effective system.

The RTC-9001 electronic is able to control any actuator equipped with a servo-valve or a servo-drive with analog input control in the range of  $\pm 10V$ ,  $\pm 5V$ ,  $0-10V$ . EnginLAB sells special pneumatic actuators for component fatigue testing.

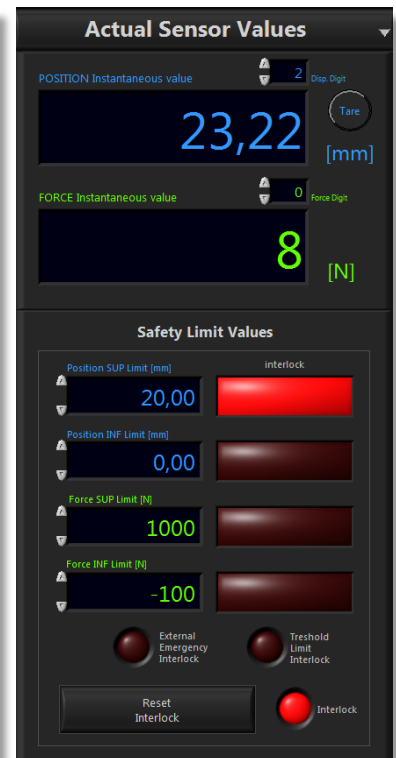
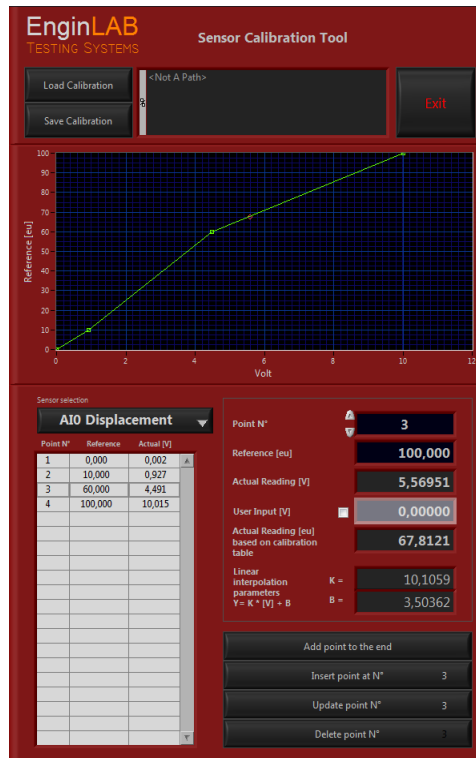
The Software is powerful and user friendly, check it on EnginLAB YouTube channel. The RTC-9001 training is completed in less than an hour.

The software is also available for torque test.



## RTC-9001 Pneumatic technical characteristics

- user interface developed with LabVIEW
- perform static test with Force or Displacement feedback
- load or Displacement feedback control selectable on the fly
- procedure test editor
- SetPoint with ramp mode and hold, sine triangular and squared waves function generator
- selectable PID output voltage
- PID coefficients can be changed on the fly
- perform cyclic testing
- amplitude control during fatigue test
- actual cycles monitoring
- safety limits both for force and displacement
- force versus displacement graph
- continuous Recording, Max Min Vs. Cycles recording
- Export data to csv format
- sensors max min monitoring versus cycles
- analog input  $\pm 10V$  for Force Transducer
- analog input  $\pm 10V$  for Displacement Transducer
- analog input  $\pm 10V$  Aux1, Aux2 (on request)
- Sensor Calibration Tool for table data calibration coefficients
- Save and load for different system setup
- works with electronic RTC-9001
- software version for two actuators control (on request)
- reproduce variable amplitude load history (on request)



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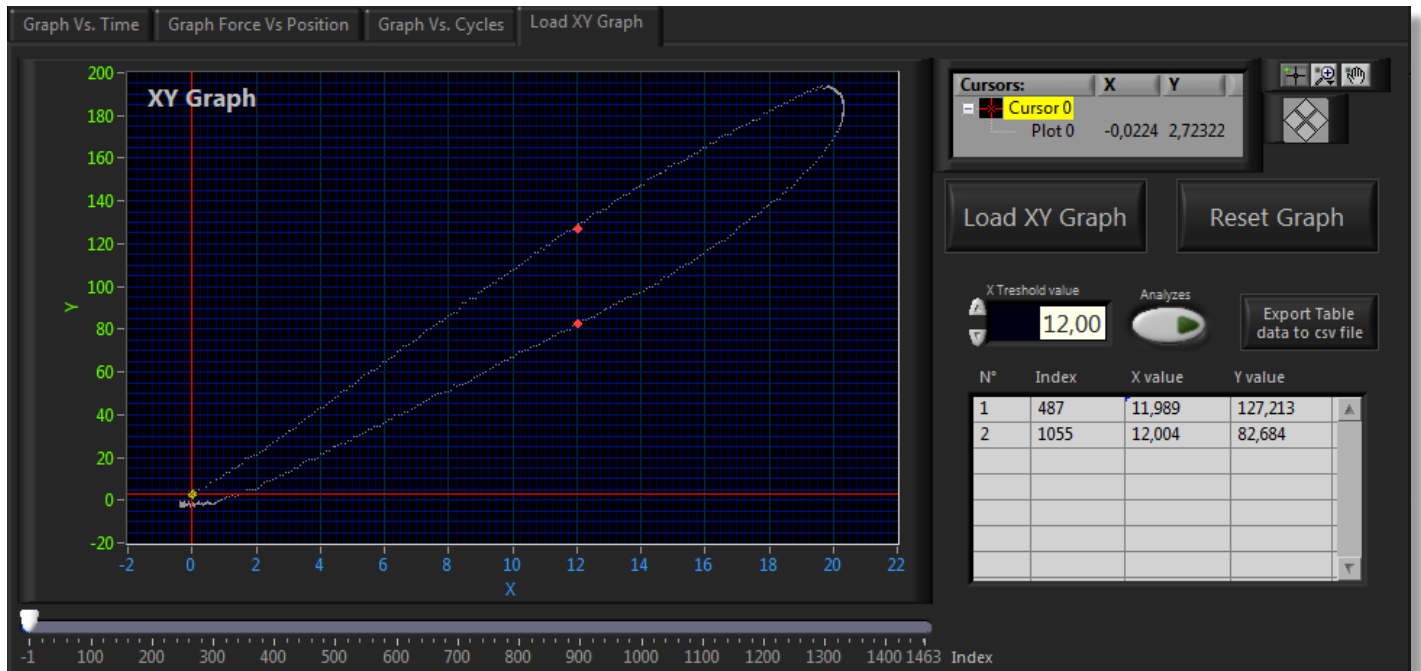
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# Software for fatigue test on materials and components

## XY graph and analysis tool



## Actuator control modes

The screenshot shows the 'Actuator Control Menu' for 'Position Control'. It includes a 'Ramp SetPoint' dropdown, and several input fields: Frequency [Hz] (0,00), SetPoint [mm] (29,24), SetPoint Max [mm] (0,00), RampRate [mm/s] (10,00), SetPoint Min [mm] (0,00), and DutyCycle [%] (50). There are three toggle switches: 'S1 Valve Enable', 'Enable Control', and 'Position PID'. The 'Position PID' section has proportional gain (0,50), integral gain (0,0000), and derivative gain (0,000). The 'Peak Valley Adaptive Control' section has Peak Valley increment (0,010), MaxSpActual (0,00), MinSpActual (0,00), and a 'PVenable' toggle switch. At the bottom, there are 'Home' and 'Emergency STOP' buttons.

The screenshot shows the 'Actuator Control Menu' for 'Force Control'. It includes a 'Ramp SetPoint' dropdown, and several input fields: Frequency [Hz] (0,00), SetPoint [N] (5), SetPoint Max [N] (0), RampRate [N/s] (10), SetPoint Min [N] (0), and DutyCycle [%] (50). There are three toggle switches: 'S1 Valve Enable', 'Enable Control', and 'Force PID gains'. The 'Force PID gains' section has proportional gain (2,00), integral gain (0,0001), and derivative gain (0,000). The 'Peak Valley Adaptive Control' section has Peak Valley increment (0,010), MaxSpActual (0,00), MinSpActual (0,00), and a 'PVenable' toggle switch. At the bottom, there are 'Home' and 'Emergency STOP' buttons.

## Sensor setup parameters

The screenshot shows the 'Parameters' window for 'Displacement Sensor Parameters'. It has tabs for 'AID\_Position', 'AII\_Force', 'AIZ', 'AIB', and 'General'. The 'Displacement Sensor Parameters' section includes: D1Sens [mm/V] (5,0000), Position [mm] (50,08), D1noTara [V] (10,0167), D1TaraValue [V] (0,0000), D1ValueWithTara [V] (10,0167), and D1 remove Tara (toggle switch). There are 'Load Calibration Tool' and 'Load Calibration Table' buttons, and a 'Use Calibration' checkbox. At the bottom, there is a table for 'Point N° Reference [mm] [Volt]' and a 'Home' button.

## Procedure editor

Step N°	Mode Control	Wave Type	SetPoint [eu]	RampRate [eu/s]	HoldTime[s]	Rec.
1	Displacement Control	Ramp Setpoint	0,000	10,000	1,000	No
2	Displacement Control	Ramp Setpoint	25,000	10,000	5,000	Rec
3	Displacement Control	Ramp Setpoint	30,000	50,000	5,000	Rec
4	Displacement Control	Ramp Setpoint	0,000	10,000	1,000	No

## Loop procedure

Step N°	Mode Control	Wave Type	SetPoint	RampRate	HoldTime	Rec.
1	Displacement Control	Ramp Setpoint	0,000	10,000	1,000	No
2	Displacement Control	Ramp Setpoint	25,000	10,000	5,000	Rec
3	Displacement Control	Ramp Setpoint	30,000	50,000	5,000	Rec
4	Displacement Control	Ramp Setpoint	0,000	10,000	1,000	No

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