BESMAK BMT-1000S

1000KN UNIVERSAL TESTING MACHINE

(GENERAL CATALOG)

DOLI CONTROLLED SERVO-HYDRAULIC UNIVERSAL TEST SYSTEM

TECHNICAL FEATURES:

Maximum Load Capacity:	**1000 kN**
Frame Type :	Rigid frame in 4-Column construction.
Electronic Unit:	DOLI Controller (Made in Germany)
Control:	1) Hydraulic Unit, Servo-Valve is by MOOG (USA) 2) DOLI EDC-220 Controller 3) DOLI RMC-7 Handheld Unit 4) DOLI Test&Motion Software (Load and Displacement Control)
Accuracy:	± 0.5%
Load Measuring Range:	1% - 100% of full capacity
Resolution:	1/180000 of maximum load capacity
Displacement Resolution:	0.001 mm
Speed of Displacement Control:	Minimum 0.1 – 60 mm/min (*Contact us for other required speed)
Speed of Load Control:	Minimum 0.01 kN/s – 50kN/s (*Contact us for other required speed)
Speed of Strain Control:	Minimum 0.1 mm/min
Space Between Columns :	Minimum 600mm
Diameter of Column:	70 mm
Tensile Space:	Minimum 600 mm (*Contact us for other required test space)
Compression Space:	Minimum 500 mm (*Contact us for other required space)
Tensile Grip for Flat Specimen:	0 – 30 mm
Tensile Grip for Round Specimen:	4 – 40 mm
Software:	DOLI Test&Motion
Power Requirement:	220 or 380 Volt, 1.5 kW, 50/60Hz
Ambient Operating Temperature:	0°C～40°C
Dimensions of Load Frame:	Approximately 800×620×2950 mm
Dimensions of Hydraulic Power Unit:	Approximately 650x1250x970 mm

FEATURES:

BESMAK BMT-1000S 1000KN Universal Testing Machine, designed with rigid frame in 4-Column construction and single work/test space. Load measurement is made by a Load Cell. It is suitable for testing long samples or the samples having high strain capacity with its long range piston stroke system.

Applied Standards:

- ASTM E4, EN ISO7500-1, EN 10002-1, EN 10002-2, BS1610 and DIN 51221.
- Strain measurement (with video extensometer or mechanical/clip on extensometer) meets: ASTM E83, ISO 9513, EN 3846 and EN 1002-4. *Extensometers are an optional product.

Load Frame and Grips:

- Load frame has single workspace, rigid 4-Column compact design and bidirectional movement which make this machine feasible for tensile and compression tests.
- System is suitable for different type and size of flat and round specimens and it has a long movement space,
- High precision load measurement and control with load cell of class 0.5.
- Load Cells can be replaced according to different load ranges to make much more accurate and sensitive measurements on small samples. *Additional Load cell is an optional feature which provided on request.
- System equipped with special wedge type (V type) jaws. Grips can be replaced easily for different type and size of flat and round specimens. (The Grip system consists of suitable grips and connection apparatus.),
- Distance between grips can be adjusted automatically by computer and RMC-7 handheld unit.

Power Unit:

- Independent serve-hydraulic unit which can be connected to piston and hydraulic grips.
- Special gear type hydraulic pump used in hydraulic power pack to reduce noise.
- Servo-valve system (MOOG USA) is used for accuracy, smooth control and accurate loading.

Control Features:

- Control unit of **BESMAK BMT-1000S, 1000KN Universal Testing Machine** is DOLI EDC-220 with 1000 data per sec. acquisition and control rate.
- Control unit has total 4 channels to connect different type of sensors like LVDT, Load cell and extensometers at the same time.
- Due to DOLI EDC-220 control unit, user can use machine in load control mode, position control and strain control mode as well.
- All; Load, position and deformation parameters can be controlled real-time.

ELECTRONIC CONTROL SYSTEM:

CONTROLLER

BESMAK BMT-1000S 1000KN Universal Testing Device, is controlled by "**DOLI Control**" System (Made in Germany). This system is world's one of the sensitive electronic control systems and used since 1975. It controls hydraulic and electro mechanic systems by closed-loop (PID) control method.

The load and strain tests can be done with both load and displacement control by DOLI. With displacement control, user can obtain much more accurate and sensitive readings. DOLI system has 1 kHz data acquisition speed.

Load cell, video extensometer, automatic extensometer, etc. can be connected to DOLI electronic control units (EDC-220 and RMC-7). Test&Motion software can recognize these sensors and their calibration can be easily done.

Special plugs are used to attach a sensor with DOLI control system. These special plugs can save the calibration data in their own memory so if someone plug out the sensor or change the control unit, system will never lose calibration data.

Controller has the excessive load protection system and can detect the specimen failure automatically. Also, user can reset the load at the beginning of the test.

Displacement can be adjusted between 0.1 mm/min and 60 mm/min.

User can control test, can adjust device settings and can control hydraulic grip by computer software and hand held unit; tests can be carried out by a single button.

DOLI Controller can detect indirect loads before the test (these loads can occur because of grips and mechanical system, etc.) and can prevent them affecting the test results.

Return of piston can be done automatically after the test also user can use computer software and RMC-7 to do so.

Units of system can be converted into SI and metric units.

EDC-220 control unit can be connected to computer via USB or Ethernet.

TEST&MOTION Software

Tests can be carried out on computer by DOLI Test&Motion software. Real time data, graphs and results can be observed on software. Results and graphs can be saved on computer and user can take a print of it. User can personalize the software according to company/corporation.

Test&Motion is compatible with Windows 7 and higher operating systems.

Some short keys are available on software window to move piston to adjust the sample easily and at the end of the test the piston - returns to its original position.

Test&Motion software can perform the tensile and flow tests on flat and round specimens. Applicable standard is TS EN 6892-1 *this specific standard is optional. Load at failure, strain at failure, max. Load, max. Strain, etc. can be obtained real-time and at the end of the test as well with 1 kHz/sec.

User can determine the properties of report and graph and the user also can:

- Change the parameters of "X" and "Y" axis of graph to get the required graph. (load, time, strain, displacement, stress etc.)
- Upper flow, lower flow, maximum tension and failure tension can be shown on graph,
- Select a specific point on the graph and see its load/tension, form/unit, deformation, failure strain ratio, total uniform strain ratio etc.
- See every single specimen's graph when test done on multiple specimens.
- See Modulus of Elasticity,
- Collect the data separately, for every specimen/set of specimen.
- In test report the user can see the description of specimen, properties of the material, type of the specimen, preparation features of the specimen, how the strain is calculated and test results. Also, the user can assign the information about specimen number, test date, deliverer of specimen, names of the persons who perform the test and signature space on test report.

Test and device settings could be easily done with the software. Also, the software supports at least 9 languages. Our company is available 7/24 for online help.
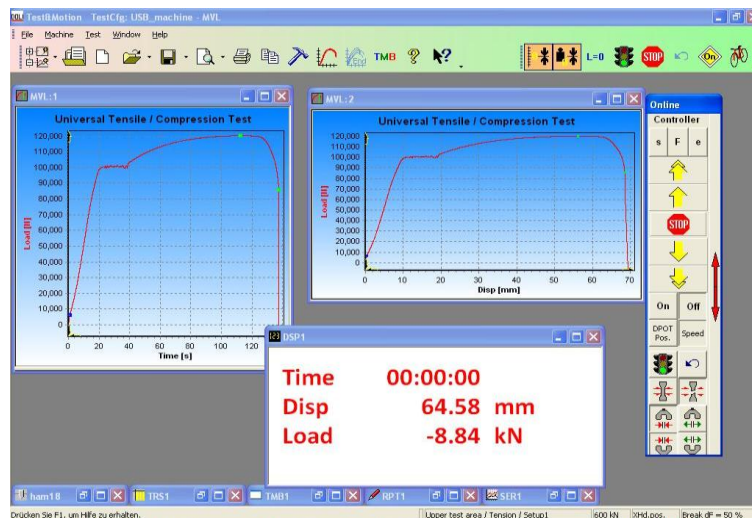
Handheld Controller:

With the help of **DOLI RMC-7** handheld unit the user can perform test speed control, grip movement controls, load/deformation, and strain, observe real time strain values, control movement/position of grips, assign max.-min. limit etc.

The most important property provided by DOLI handheld unit is that the user does not have difficulty when placing the specimen into the grips because of the mobility of the unit. Handheld unit comes with a magnet attached and can be placed easily on metal surfaces.

In an emergency case, test can be stopped immediately by pushing the red emergency button on the RMC-7 (which is located on the upper right side of the handheld unit).

2950 mm.

500 mm.

610 mm.

390 mm.

675 mm.
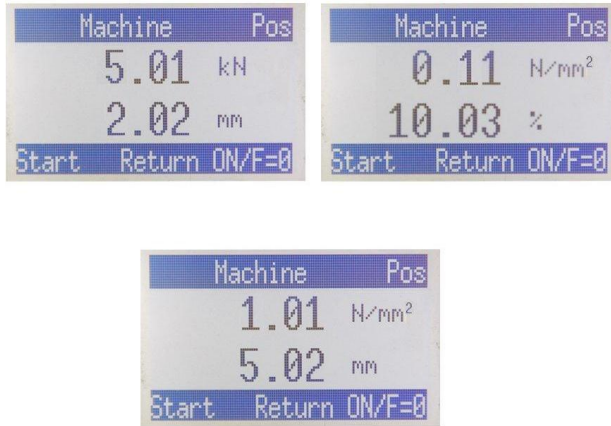
TECHNICAL FEATURES:

- Device is useable for the load and displacement control, strain and flow tests, failure of strain tests done on flat and round specimens.

- Applicable standards: EN ISO 6892-1, EN ISO 7500-1.

- The system is hydraulic type where servo valve control the movement of piston accurately.

- Flow capacity of the servo-valve is min. 20 ltr/min.

- Capacity is min. 1000kN.

- 4-Columns rigid construction.

- Distance between front columns is min. 600 mm.

- Distance between columns in sides is min. 340 mm.

- Height of the frame is max. 3000 mm.

- Distance between grips is min. 600 mm. and grip adjustment is hydraulic.

- Stroke is min. 500 mm.

- Double-acting hydraulic cylinder.

- Hydraulic power and handheld unit is designed separately from the body.

- Max. working pressure of hydraulic unit is 300 bar.

- The system works correctly at the; temperatures of 10°C-40°C,

- Device can perform tests on metallic round specimens. Their diameter should be between 4 mm and 40 mm.

- Device can perform tests on metallic flat specimens. Their thickness should be between 0-30 mm.

- Device can perform the strain and flow tests which can give the data of failure load, failure strain, max. Load, max. Strain, etc. Standard: TS EN ISO 6892-1
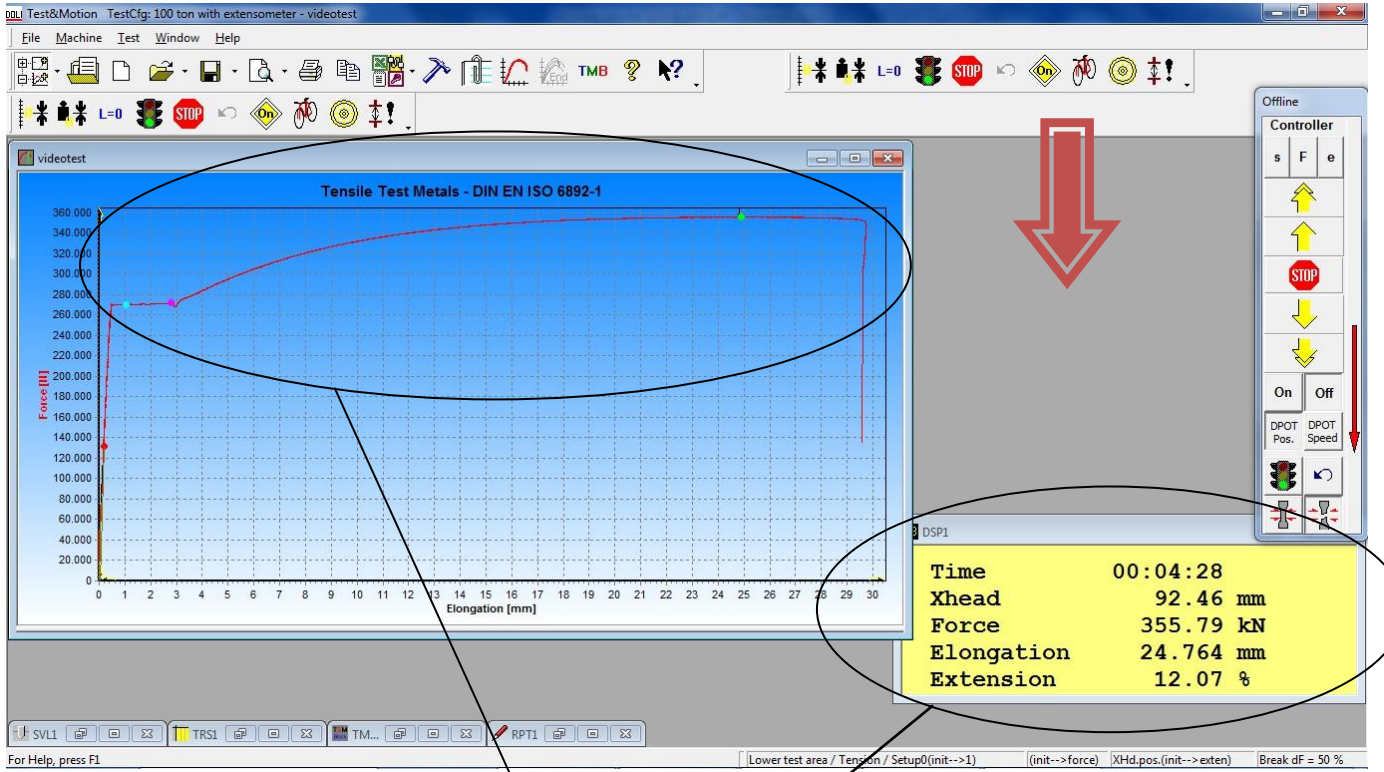
Graph and test results.

- Handheld unit can display the load and deformation values on the screen, adjust the test speed, move the cap up and down, adjust the position of grips, opening/closing the grips, automatically stops when the piston reaches to max. Displacement point.

- There is an emergency stop button on the upper right side of the handheld unit.

- Device has excessive load protection system.
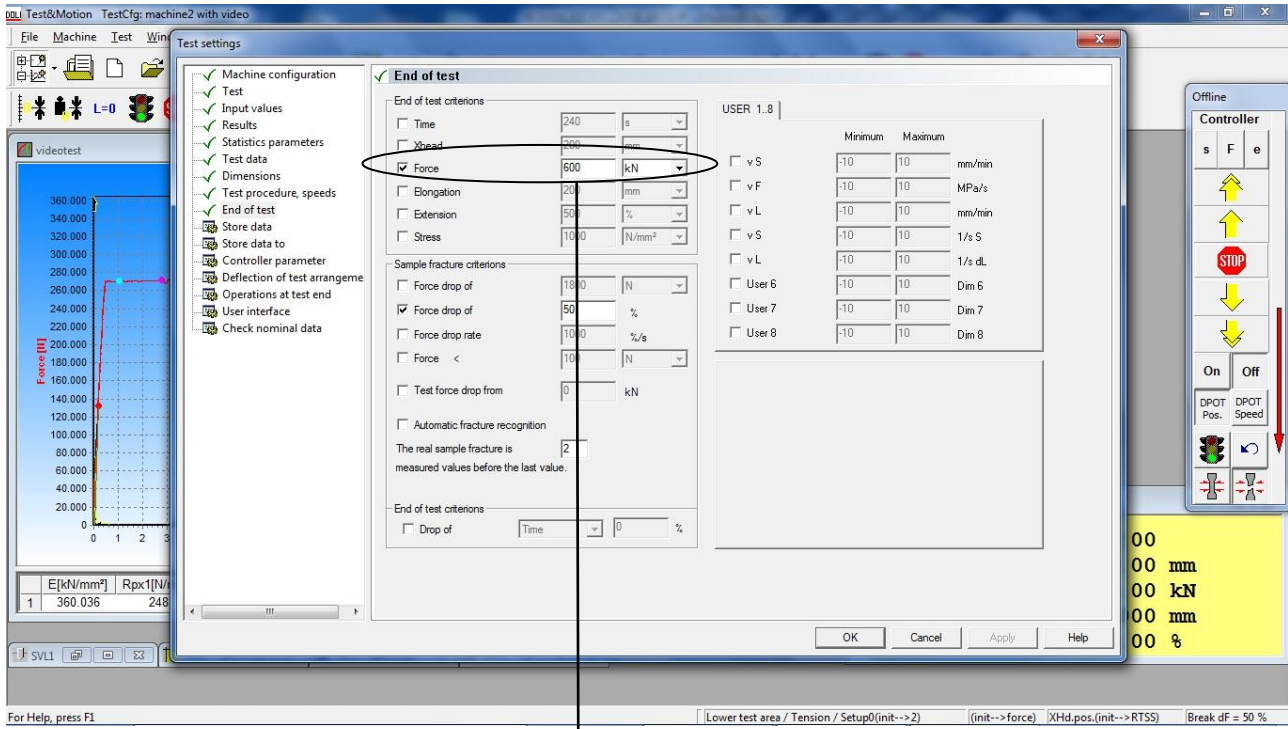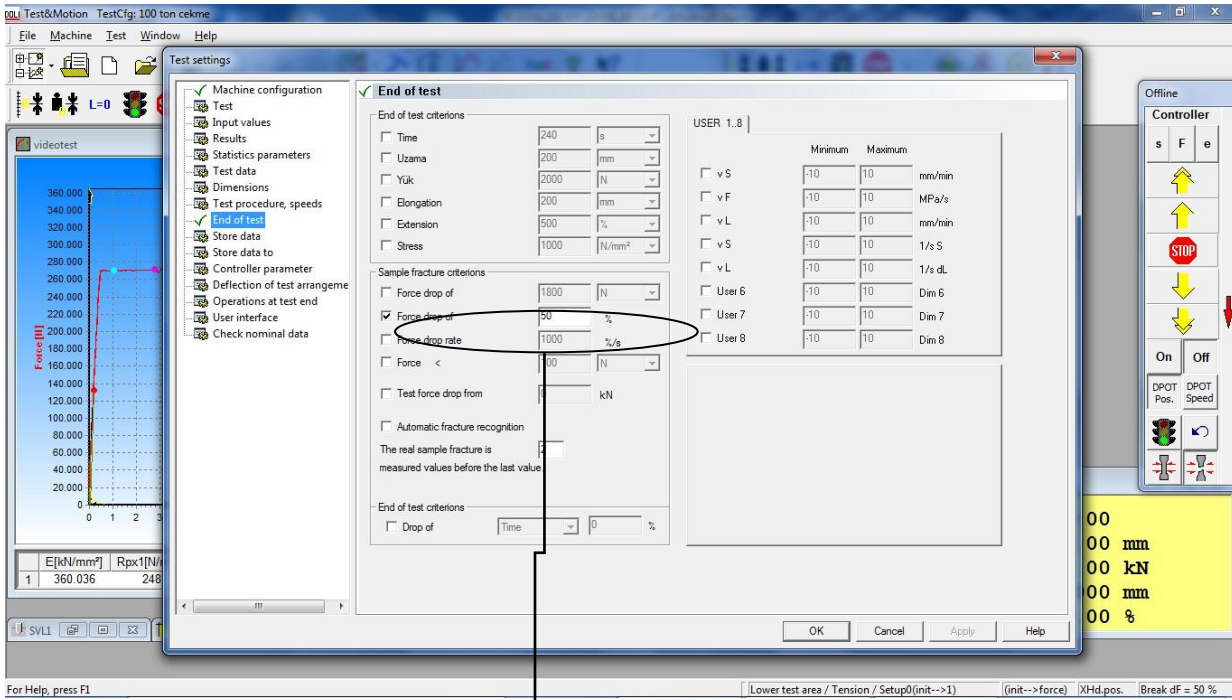
Excessive load protection parameters.
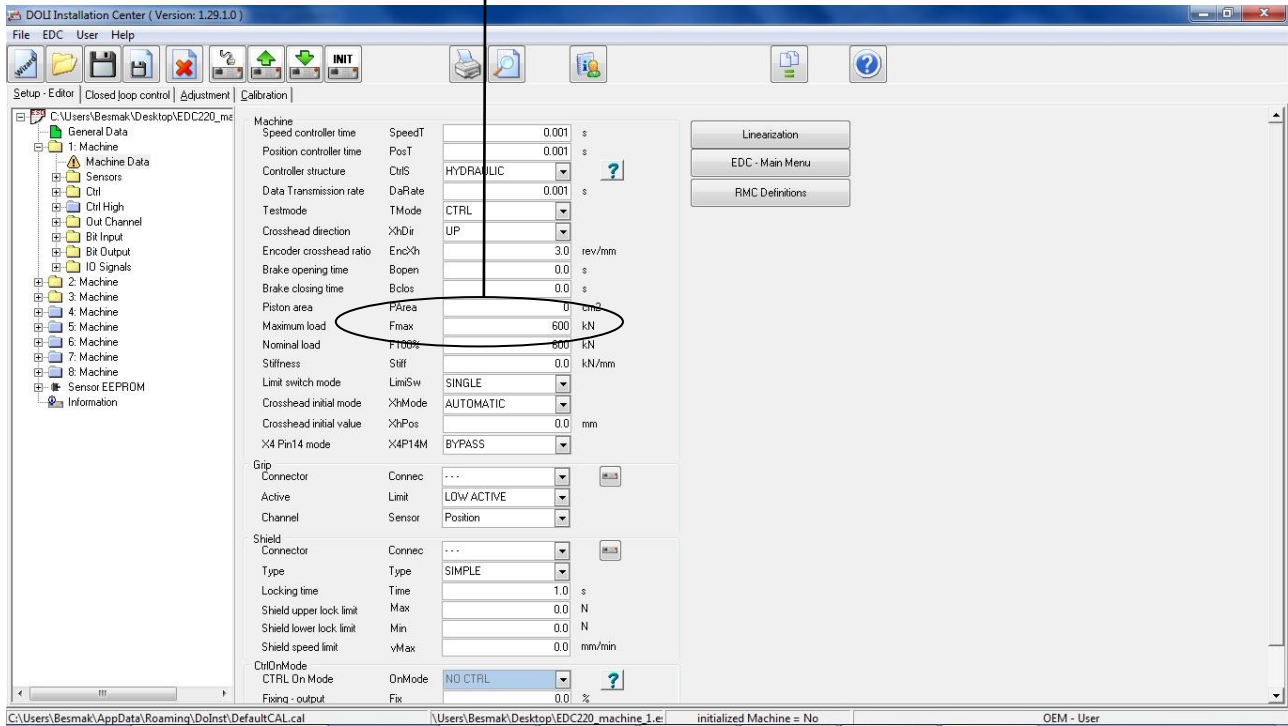
● Device can automatically reset the data at the beginning of the tests.
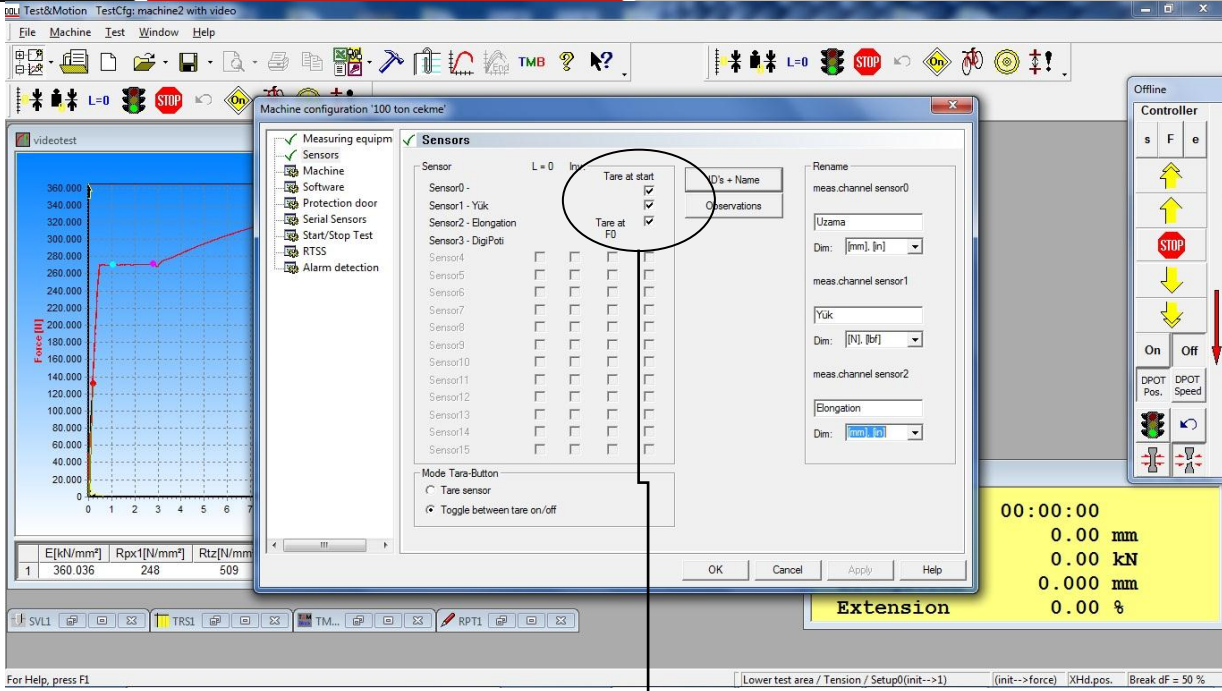
Automatically reset the sensors

- Device can detect failure automatically.

Test can be stopped automatically at a user defined load loss.

- Device returns to its original position automatically at the end of the test.
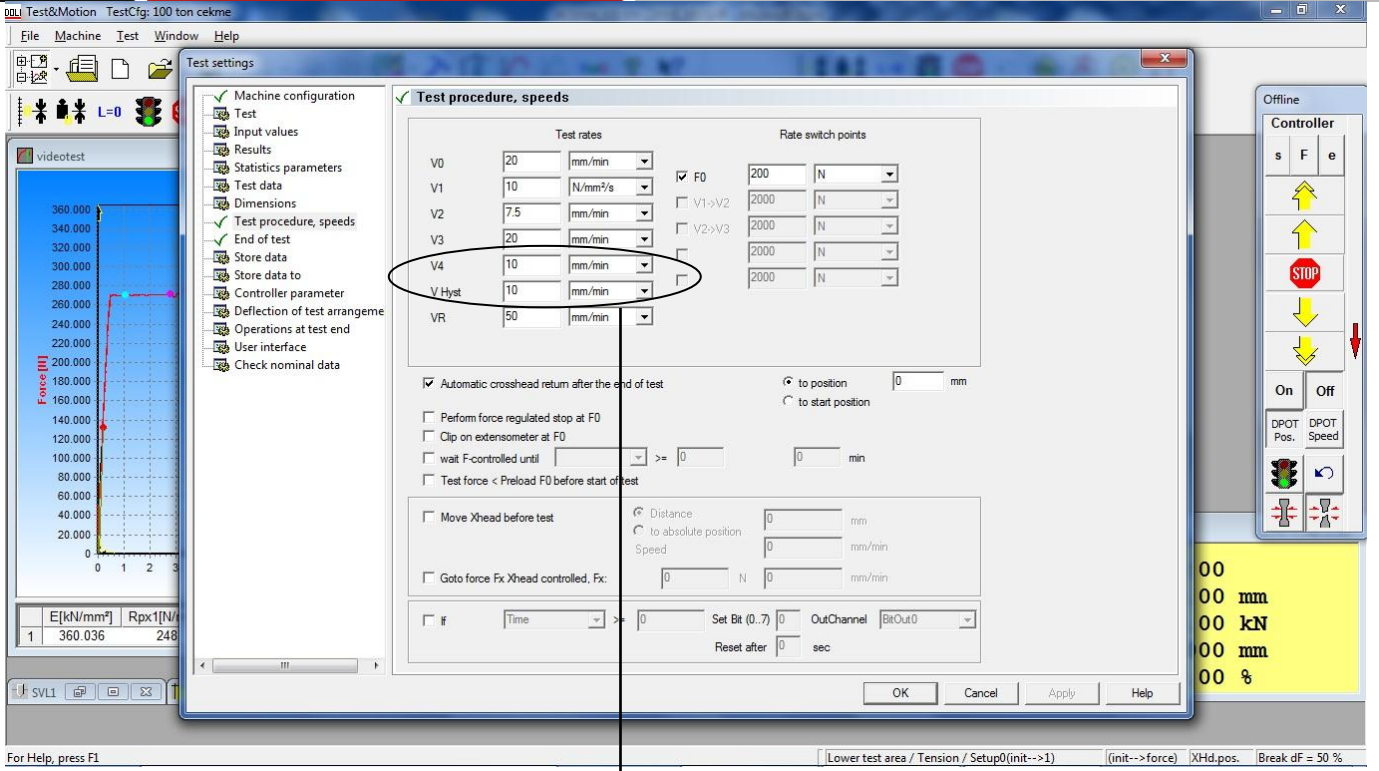
Returning to the original position

- User can set the load speed between 0.1 mm/min and 60 mm/min. Device can perform the load speed between 1 mm/min and 60 mm/min with a ±1% error.

- Strain controlled tests can be performed on the device. Strain speed can set to a constant value and can tolerate it.
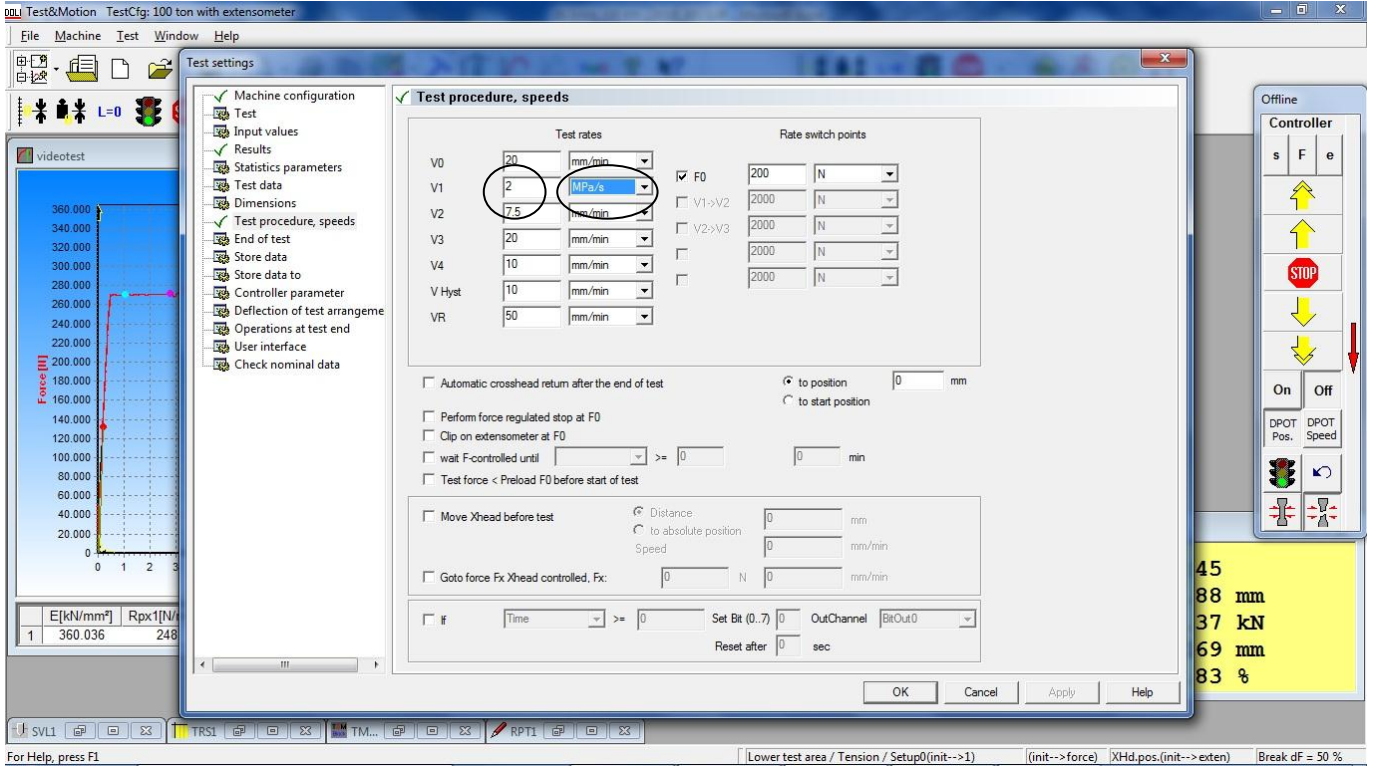
- Load measurement is done by Load Cell.

- Electronic control unit data reading rate is at least 1 kHz.

- Standard: EN ISO 7500-1. Class: 0.5

- Displacement measurement resolution is at least 0.01 mm
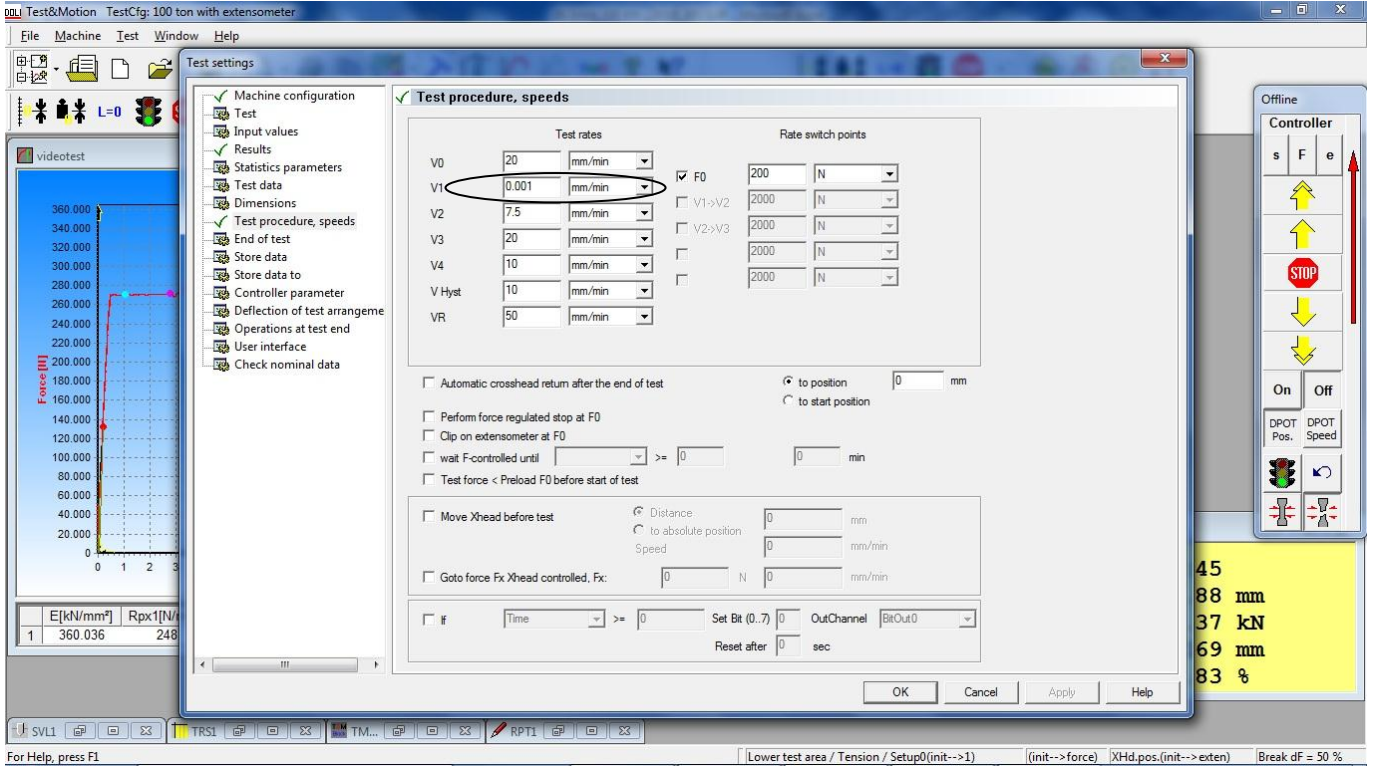
- Device has hydraulic grip system. Grip is produced from a single block.

- Grips are appropriate for the V shaped beds and specimens. Grips can be attached without disassembling the base.

- Hydraulic grips can be changed according to the type of the specimen.

- Distance between the grips can adjust automatically by electronic control unit and handheld controller automatically.

- Before the test, device detects the indirect loads (e.g loads of grips, loads of mechanical systems', etc.) and prevents these loads to affecting the test result by the help of the direct load measurement system.
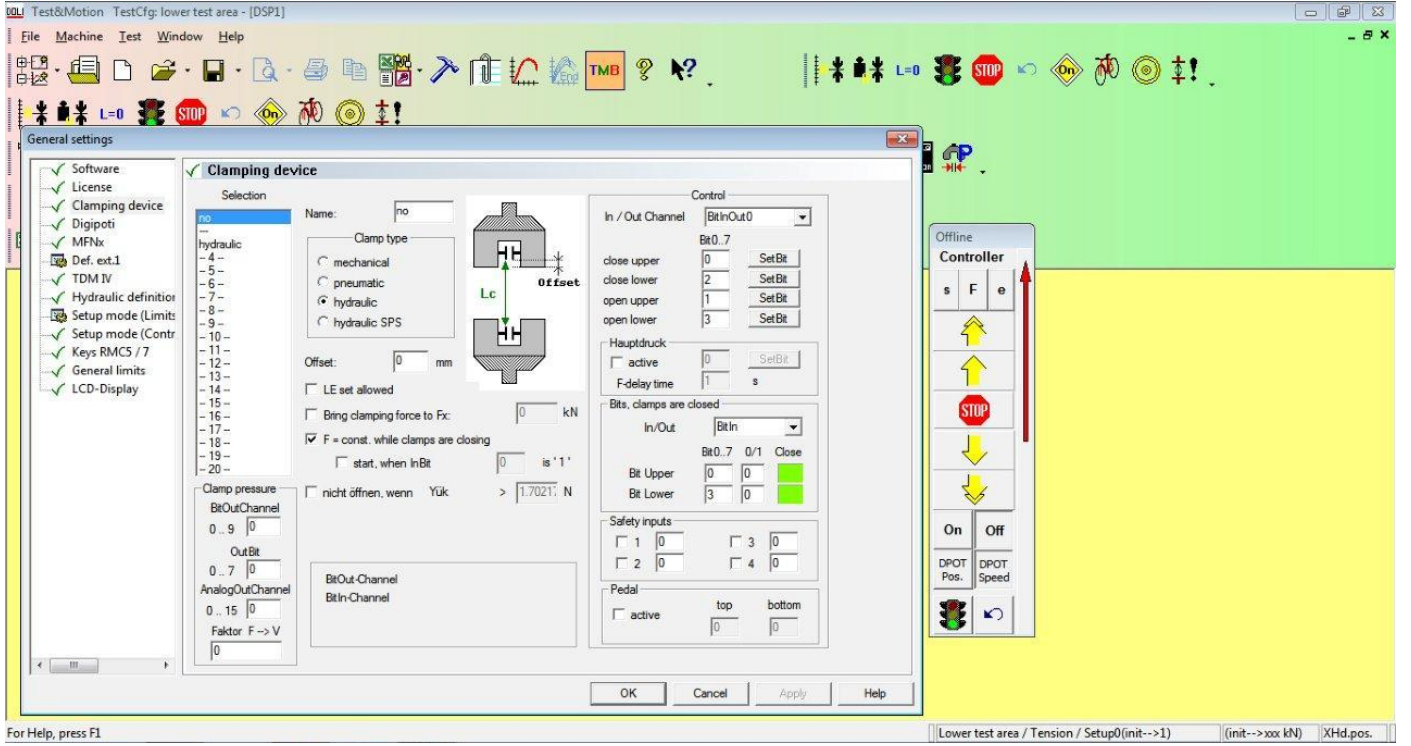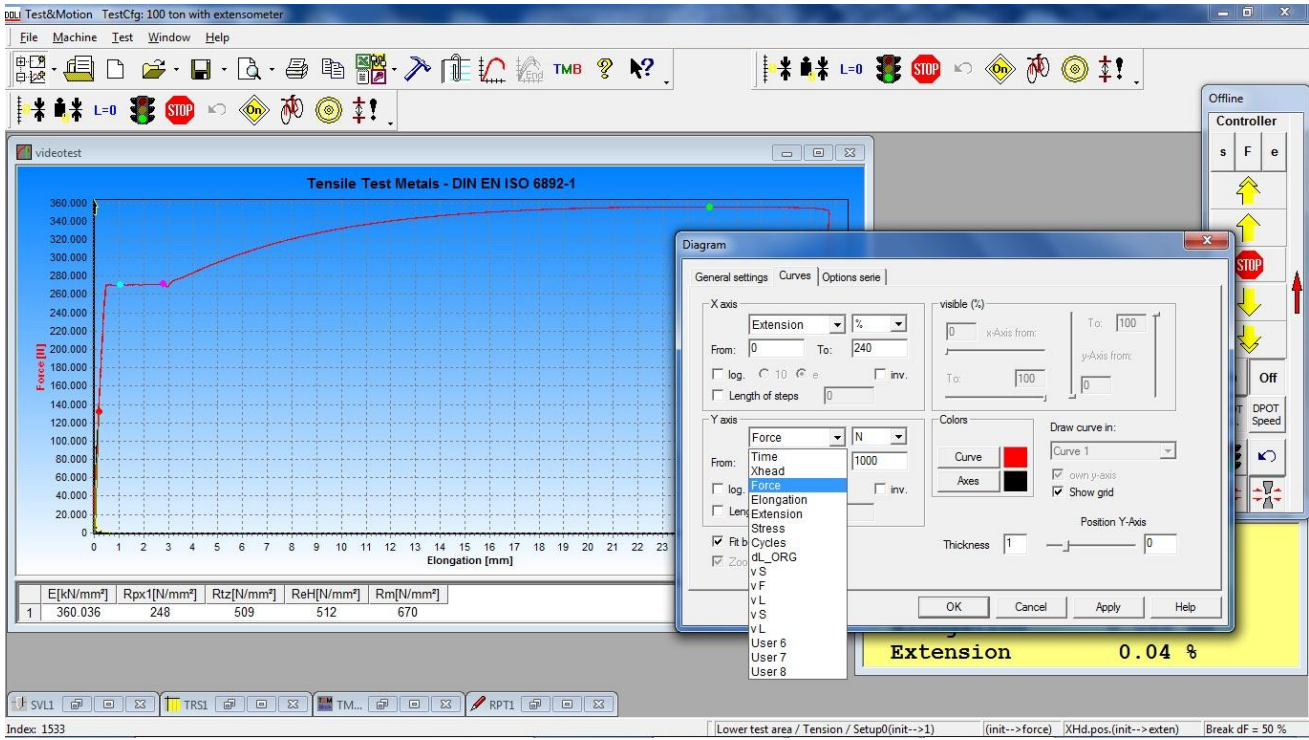
- Tools required for the grip holders are delivered with the grips.

- Units are SI units and in metric system.
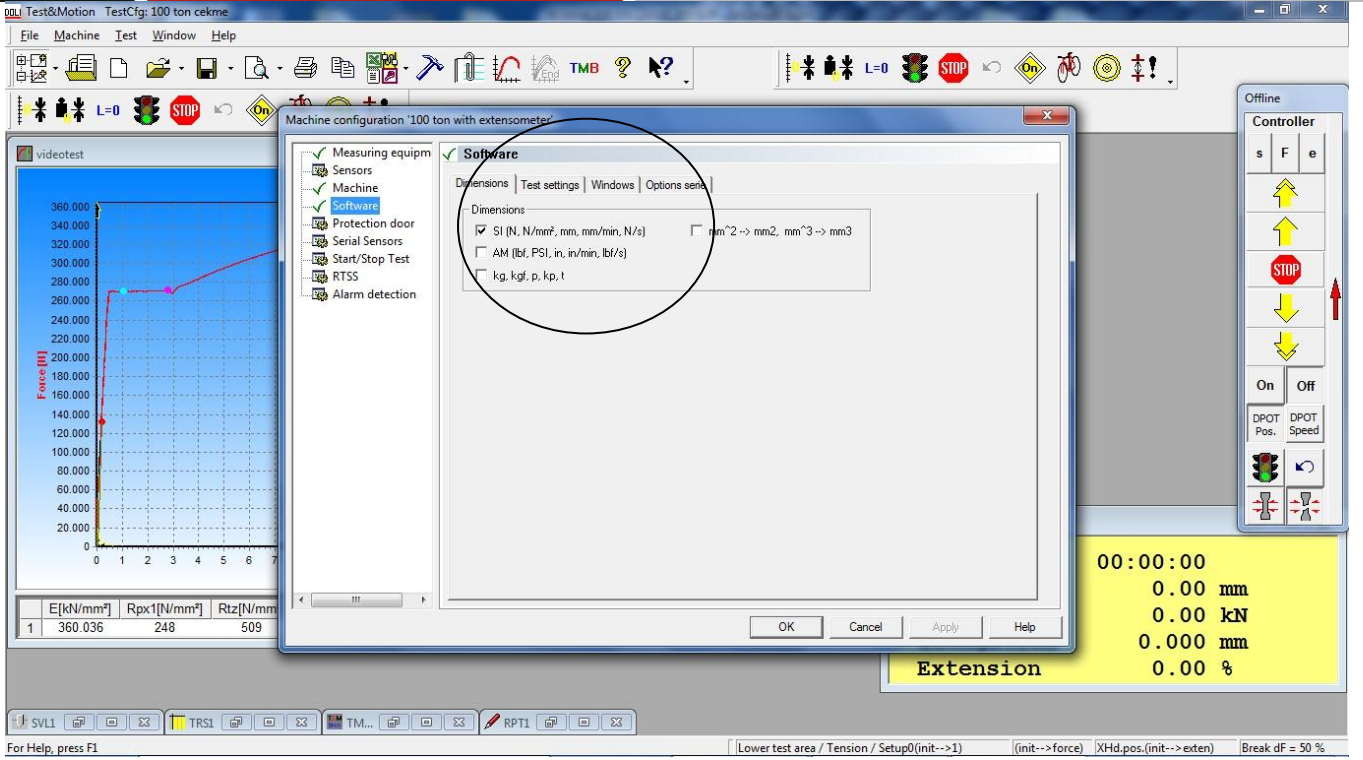
- Device is connected to PC via USB or Ethernet cable.

- Software is licensed and delivered on a CD.

- Software can generate graphs of specimen as load or strain on Y axis, deformation or unit deformation is on X axis.
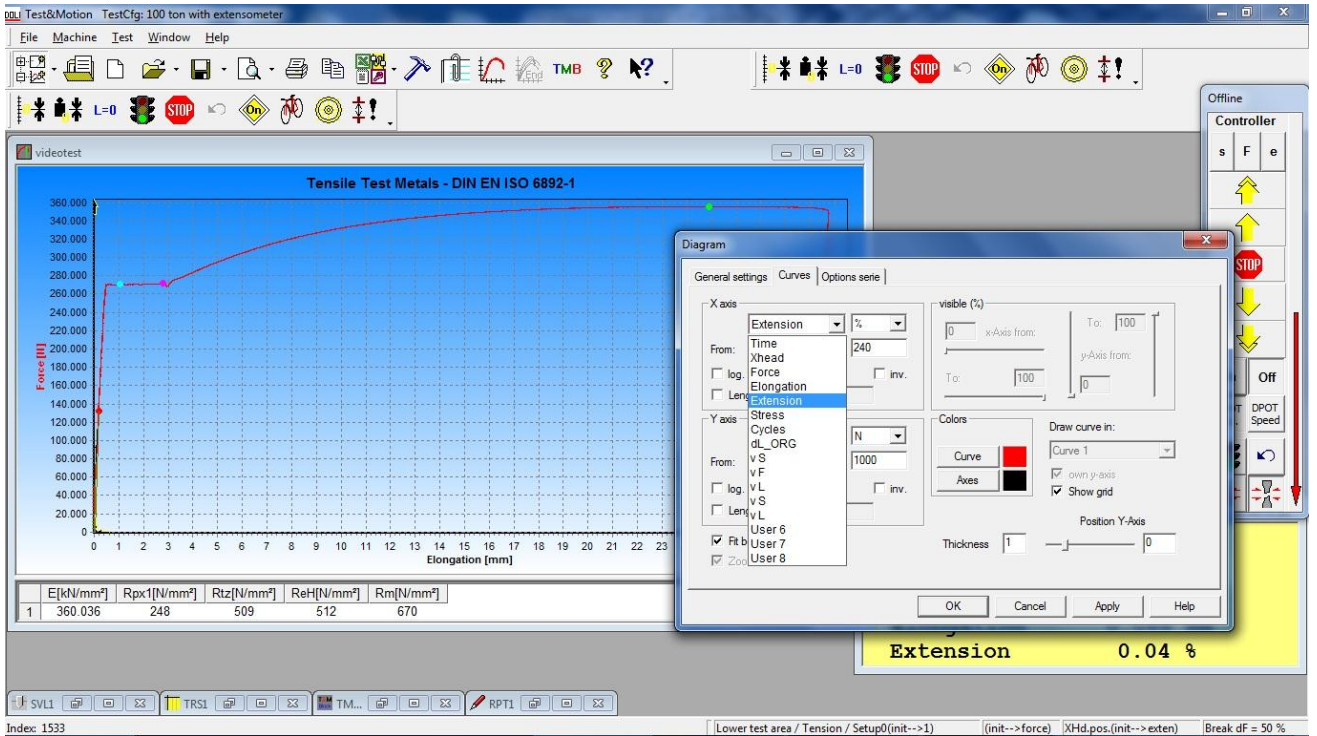
- Upper and lower flows max. strain and failure strain shown in graph.

- User can read ratios and total elongation percentage on the graph.

- User can read load/tension, deformation/unit deformation at any point on the graph.
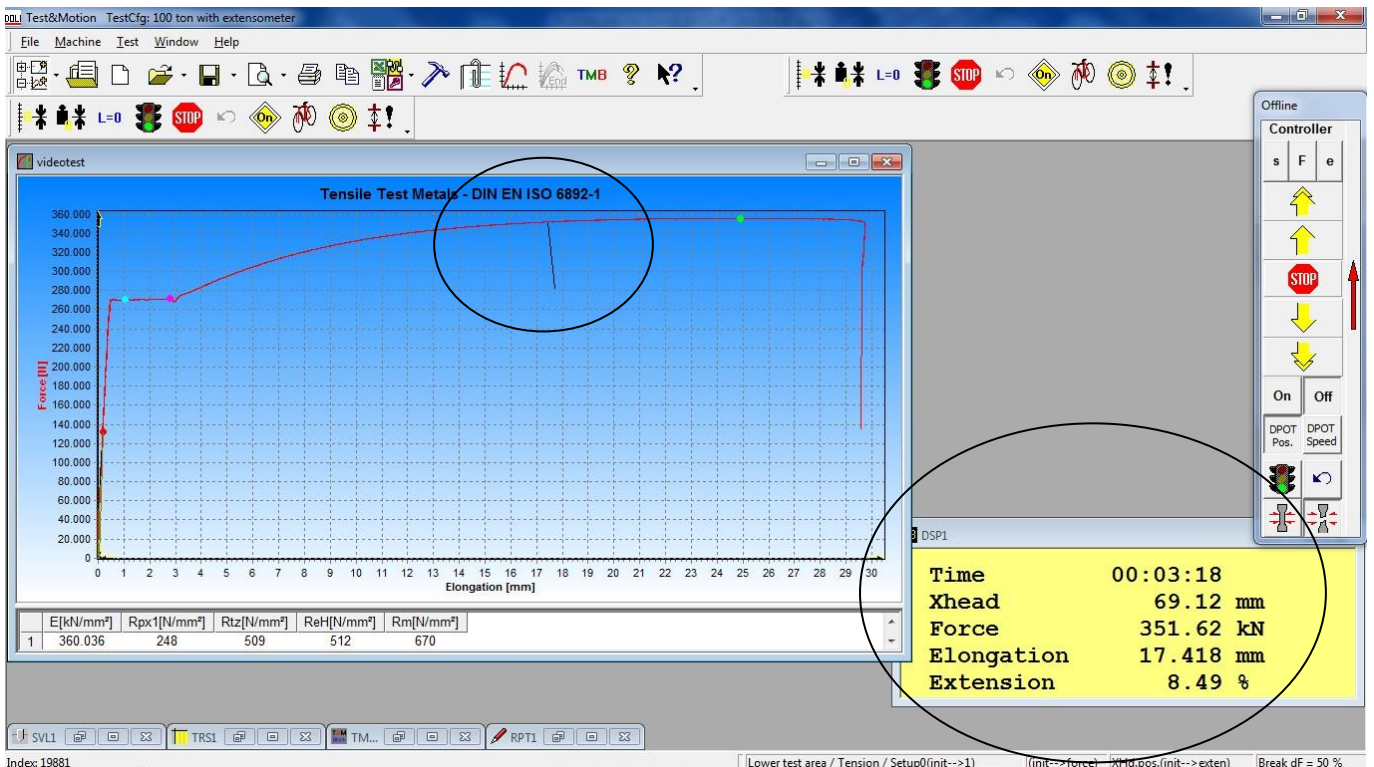
- User can see every single specimen's test results separately when a test done on multiple specimens.

- Every single specimen's test results data would be saved separately and when proceeded to another test, old data would not be erased. In the test report, user can see; specimen definition, properties of material, laboratory number, specimen transferee, date and reference number, type of the specimen, preparation of specimen, how the elongation had been calculated, title of the persons who are carrying the test and signatures and test results.

- Our company, supplies technical service to keep the software up to date.

- Voltage: 220 V or 380 V and Frequency: 50-60 Hz.