Model WAW-1000E Computer Control Electro-Hydraulic Servo Universal Testing Machine

Applications:

Model WAW-1000E computer control electro-hydraulic servo universal testing machine is a superior version
UTM. It is suitable to test various metallic & non-metallic materials for tension, compression, bending and
shearing strength. It can be capable of testing the characters of materials on physical & technology properties.
Equipped with the computer & Software & printer, it can display, record, process and print the test results, and
control test procedures as the set program and can draw test curves automatically in real time. The machine
complies with ASTM, DIN, ISO standards. It is simple, easy to operate and widely used in works, laboratories
and high schools for material properties research and quality control.

Applied Standard:

- Load meets or exceeds the following standards: ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221.
- Strain measurement meets or exceeds the following standards: ASTM E83, ISO 9513, BS 3846 and EN

10002-4

- Safety: This machine shall conform to all relevant European CE Health and Safety Directives EN 50081-1,

580081-1, 73/23/EEC, EN 61010-1

- ISO6892: DIN EN 10002-1, JIS Z2241, BS-18, ASTM E8: Metallic Material-Tensile Testing at Ambient

Temperature.

- ASTM A370: Standard Test Methods and Definitions for Mechanical Testing of Steel Products

Load Frame

- Compact design with rigid four-column & two-lead screw construction.
- Dual workspace design: upper for tension test (expandable for peel & tear test etc), lower for compression, bending and shearing tests, which is quite convenient for different kinds of tests.
- The frames all incorporate human factor consideration in the design to ensure safety, improve testing efficiency, and reduce operator weariness.
- Cylinder mounted at the bottom of the machine to guarantee the working gravity.
- Test space can be extended according to the length & elongation of specimen and related test requirements.

Crosshead

The design of open front hydraulic wedge grips makes the exchange of inserts and specimen loading easier. Tensile grips are embedded into upper fixed and lower movable crosshead to keep maximum strength. Lower movable crosshead motor-driven by roller chain provides the exceptional ease of operation.

Safeguard

✧ Overload protection: When the testing load is over 2%-5% of Max. Load, the system will unload.

✧ Stroke protection: When the ram arrives at the upper limited position, the motor of oil pump will stop.
✧ Multiple protection functions: oil actuator overflow protection, oil pump over-current protection, hydraulic oil
overheat protection, overload protection and filter protection.

Hydraulic power pack

- Variable pressure hydraulic power supply provides pressure on demand, reducing heat generation, increasing oil life & eliminating the need for water cooling.
- Double control mode, manual control & PC servo control model. For manual control model, hydraulic pack is for manually loading and clamping specimen hydraulically for high efficiency of test, While test data & curves can displayed on PC, manual control mode is especially suitable for the batch broken load tests on the large scale of specimens; For PC servo control mode, all can be controlled & processed by PC automatically, closed-loop servo control of position, load, stress & strain increasing test efficiency & meeting the data consistency between collection and analysis.
- The pumping units are designed to be located in the lab with lower noise level within 65dBa.
- The oil pump, as the core heart of the oil source, is the power source of the hydraulic system. MARZOCCHI pumps from Italy and the NACHI pumps from Japan are commonly used.

The two oil pumps are high pressure gear pump, with low noise and steady performance.

Servo valve

The servo valve is an important core part, whose flow rate can be controlled through measuring & control system to realize the precise closed loop control for loading and unloading;

Load measurement:

TE has accumulated great experience in selection of superior core loading weight system in terms of materials,
design, construction technology and especially performance & accuracy. Cooperating with top-quality brands
from Germany & USA, TE made a special customs design with shielding function so that it can be optimized
match with measuring & control system for most accurate test results.
The readability can be from 2% to 100% of the rated capacity. Calibration within 0.5% accuracy can be carried
out as per ASTM E4, ISO7500-1, EN 10002-2, BS1610, DIN 51221 standards.
This special load cell provides excellent immunity to impact and side forces, rugged & low-profile measuring
body with strictly symmetrical design is optimally suited to ensure high endurance strength. Excellent linearity
guarantees highly precise measurement, additional mechanical protection of the strain gage area. It can be set
for protections of 105% over range protection, over load capacity of 150% without permanent zero shift and
over load projection of 300% of the rated capacity without mechanical damage. This meets the stringent
Weights and Measures requirements throughout Europe and the USA.

Position measurement

Wire drawing type encoder is used for measuring the displacement of actuator. High precision encoder is
applied corresponding with controller request.

Deformation measurement:

High precision electrical strain gauged extensometer will be applied for deformation measurement. Also, being
the exclusive agent of Epsilon extensometers in China, we are also experienced in providing suitable clip-on
deformation measurement solutions and non-contact deformation measurement solutions like video

extensometer and laser extensometer even under special environment such as furnace, environment chamber
etc.

Standard configuration

Model 3542-050M-020-ST(Optional)

3543 Optional

Electronics and Control Part:

Self-developed & most advanced PCIE card for testing machine realizes the functions of real time data collection, communication, measuring and control etc. according to related ASTM, ISO standards. It can be
inserted PCI slot of computer and connected with testing machine by data cable, then above functions can be
done easily. Effective sampling rate can be up to 50Hz, in addition, the different versions for sampling rate of

200Hz, 500Hz and 10 kHz are available as options to meet special test requirements.


- Remote control box is attached on the column for operating in hands for close/open of grip and up/down movement of crosshead.

Patent technology of TE:

Calibration of load and extensometer by Electrical way and provide you a quick convenient way. No necessary
to calibrate the load and extensometer by calibrators. Do the calibration
whenever you need.

Technical specification

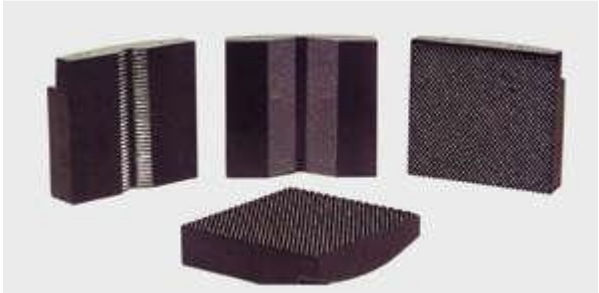
Model	**WAW-1000E**
Max. Load(kN)	1000
Load measuring range	2~100%F.S. (0.2/0.4~100%F.S optional)
Load accuracy (%)	±1
Deformation measuring range	2~100%F.S. (0.2/0.4~100%F.S optional)
Deformation accuracy (%)	±1
Displacement position(mm)	0.001
Test loading speed(mm/min)	0.5-50 (0.01-50 if configured with EDC220 controller & Moog servo valve)
Max. Crosshead moving speed (mm/min)	200
Stress control range	1~60(N/mm2)S^{-1}

Strain control range	0.00025/s~0.0025/s
Tensile space[1](mm)	750
Compression space(mm)	620
Piston stroke(mm)	250
Column Distance(mm)	570
Column Diameter(mm)	90
Working table size(mm)	650x800
Flat jaw (mm)	0-40
Round jaw(mm)	Φ20-Φ60
Jaw length(mm)	110
Jaw width(mm)	110
Platen size(mm)	Φ148x40
Bending span(mm)	50-500
Roller diameter (mm)	Φ50
Roller length (mm)	160
Bending depth (mm)	180
Net weight (kg)	3500
Max. height[2](mm)	2750
Dimension of load frame[3](mm)	900X650X2500
Size of power pack(mm)	550x550x1410
Oil tank volume(L)	110
Oil pressure (MPa)	26
Footprint (L x W)	1600x1600
Gross weight (kg)	3700
Shipping dimension (mm)	2700x1160x1100 1540x980x1725
Power supply	3PH, 380VAC, 50H, 5kW

Notes: 1. Tensile space excludes 100mm piston stroke;
2. Max. Height includes 250mm piston stroke;
3. The height of load frame excludes piston stroke

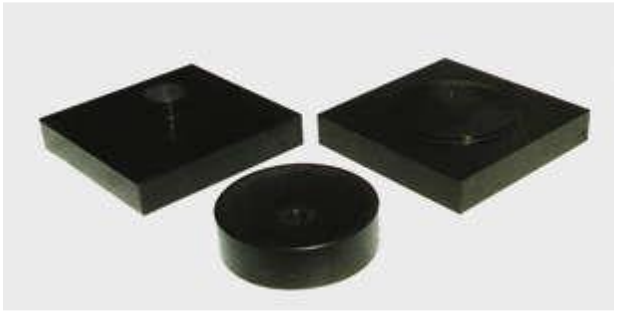
Standard Accessories:

1. Hydraulic tensile fixture



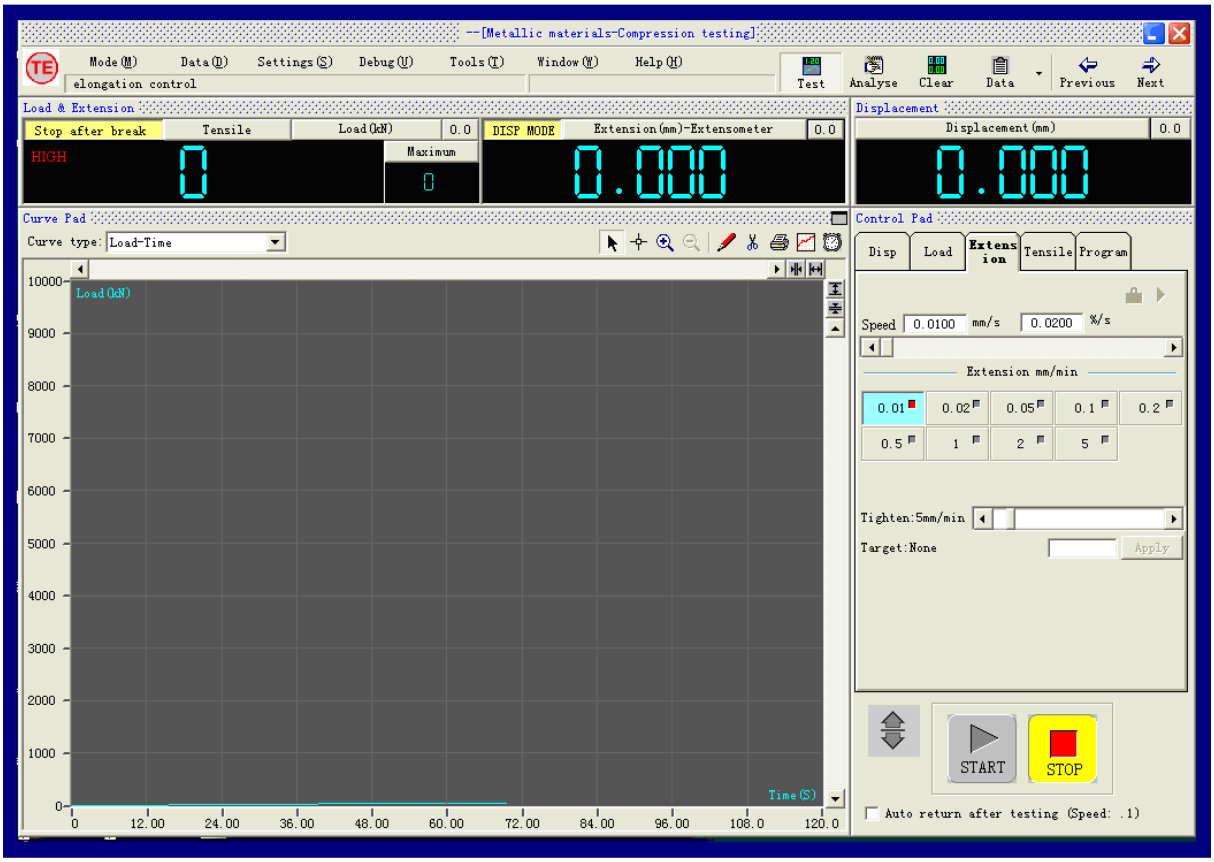
2. Flexure/Bending fixture

3. Compression fixture



4. Computer system with English version software (19in LCD) 1 set
For software please see ANNEX-1

ANNEX-1: Software Introduction
Features of Measuring & Control Software
1. Application & Features:
TE software refers to the software characteristics of the top manufacturers of testing machine in the world and
proposals of various testing requirements from the end users, and combines all the advantages of former
versions of software with lots of new features as following. Optimized software structure makes the testing
operation easy, convenient and powerful.



✧ Integrated full digital electro-hydraulic servo close-loop control, data processing with data analysis

✧ Possess multi kinds of full digital close-loop control modes, such as test load, displacement, stress and
strain. Different control modes can be switched each other freely and smoothly.

✧ Enjoy strong “programming” function of integrated test procedures, programmable steps can be up to 100
steps, and it can be also extended to complete the compilation of arbitrary complicated and control mode
switch test procedures.

✧ Software design aims to rapidity and convenience of test operation. Also adopt special design method to
meet batch technology tests.

✧ Software is managed by multi levels, and expert user can use all system parameters, which combined the
flexibility of software usage and safety & reliability of the system.

✧ Automatic data processing, processing method complies with multi international standards, such as
ISO6892-1998, EN10002-1:2001 and ASTM

✧ Multi international units are adopted, such as SI, metric system unit and British measurement, etc.

✧ Maintain multi language conversion interface, so the system can be applied under conditions of various
kinds of languages conveniently (Customized)

✧ Possess function of manual data processing, which fits to various kinds of complicated data processing for
customer.

✧ Offer test reports, which can be stored, printed and re-analyzed.

✧ Test data is stored as the form of “text mode”, and any general commercial data processing software can
reprocess test data.

✧ Rich & perfect assorted test curves

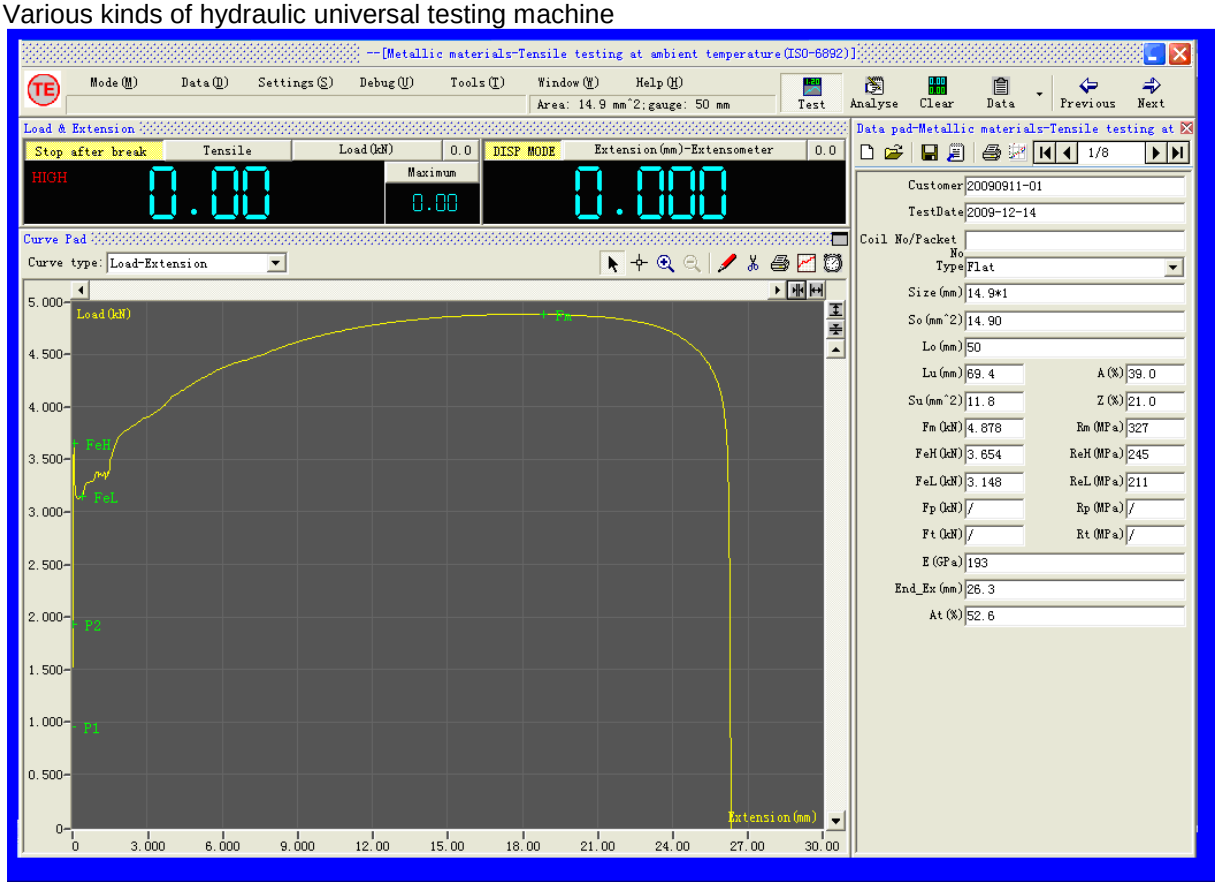
✧ Possess the function of integrated document operating system, for example, test report, test parameter,
system parameters can be stored as the form of “text mode”.
✧ Compatible with different commercial printers
✧ Control system is based on software system, so upgrade is easy.

2. Software & hardware configuration

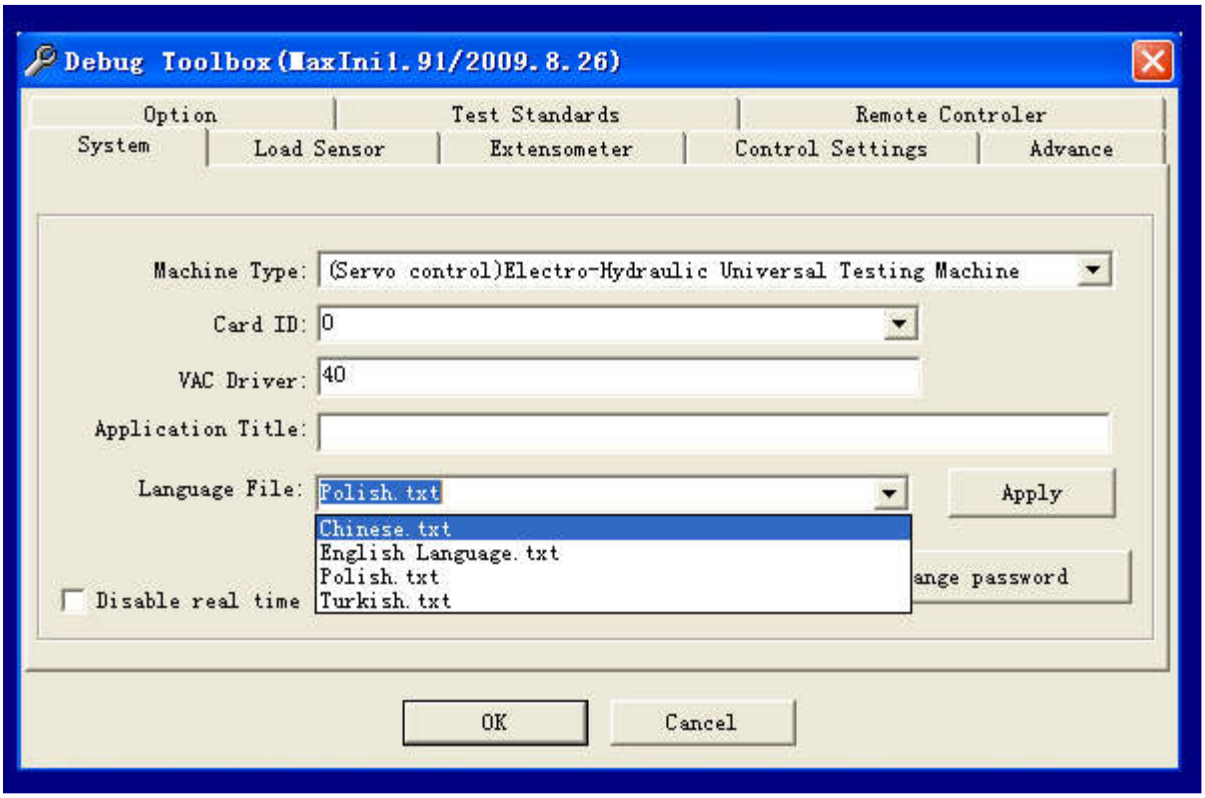
This software is used along with special PCI/ISA electro-hydraulic servo measuring & control card. Various kinds of commercial printer and driving programs

3. Interfaces of software:

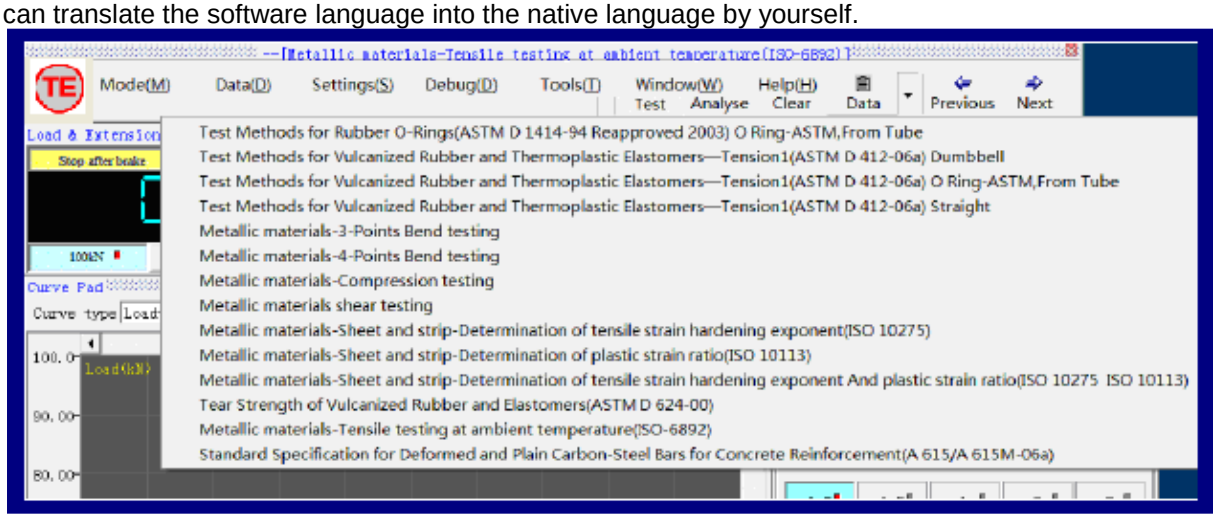
Various kinds of hydraulic universal testing machine



The control modes, test data and curves can be displayed in real time in the main interface and can be shifted at any time.

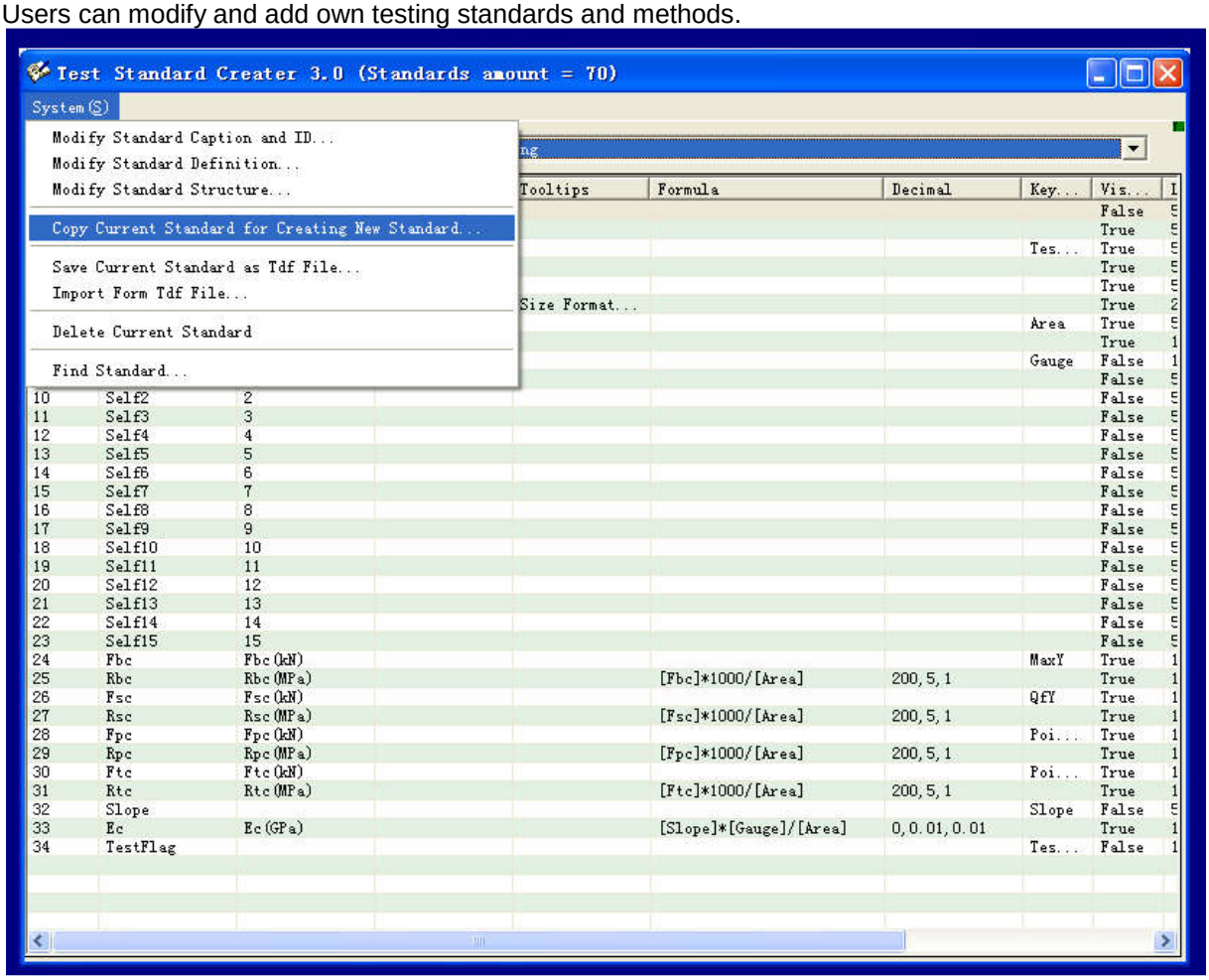


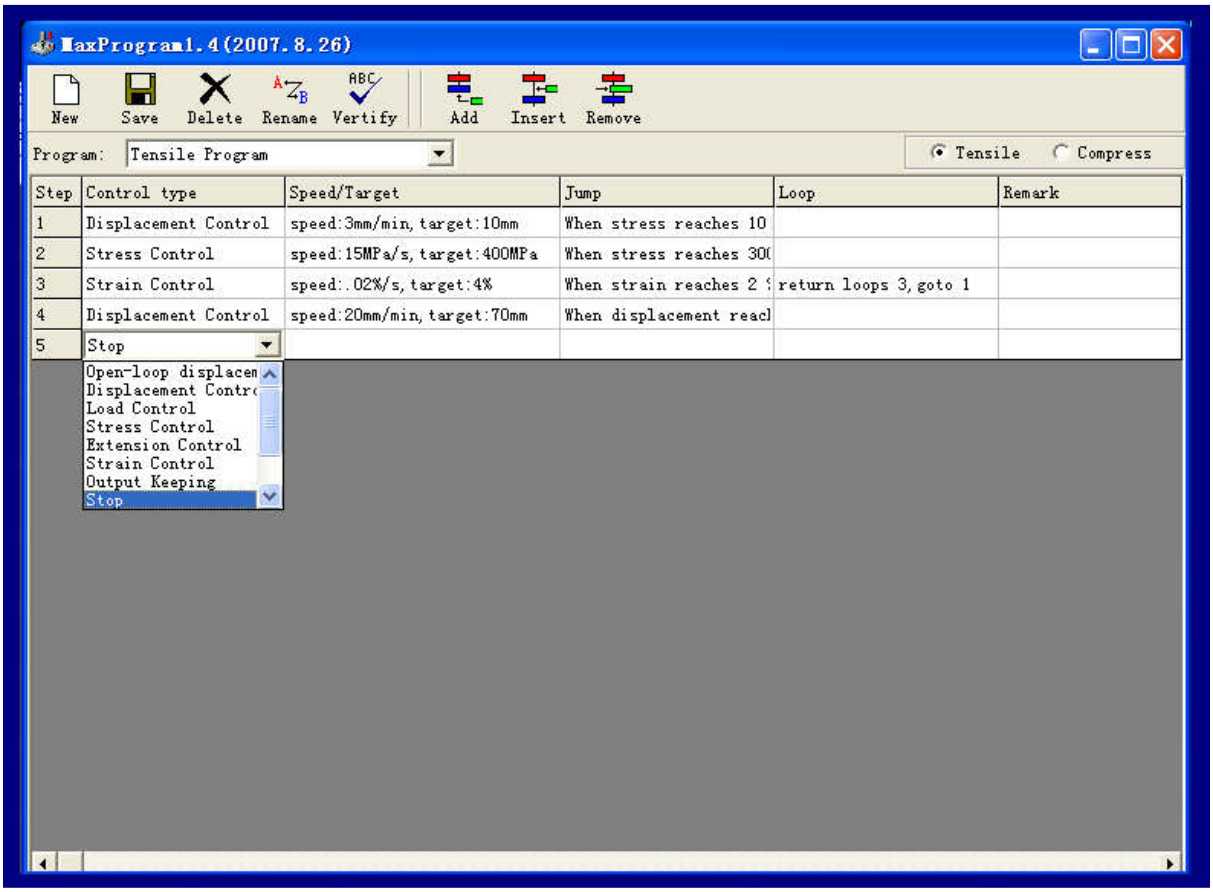
The deep-seated parameters of software are contained in Debug Toolbox
Multi-language function:
With the flexible language edited function, it can support multi-language such as English, Chinese etc. and you
can translate the software language into the native language by yourself.



Software supports all kinds of popular testing standards i.e. ISO, ASTM, BS EN, DIN, JIS, GB etc.

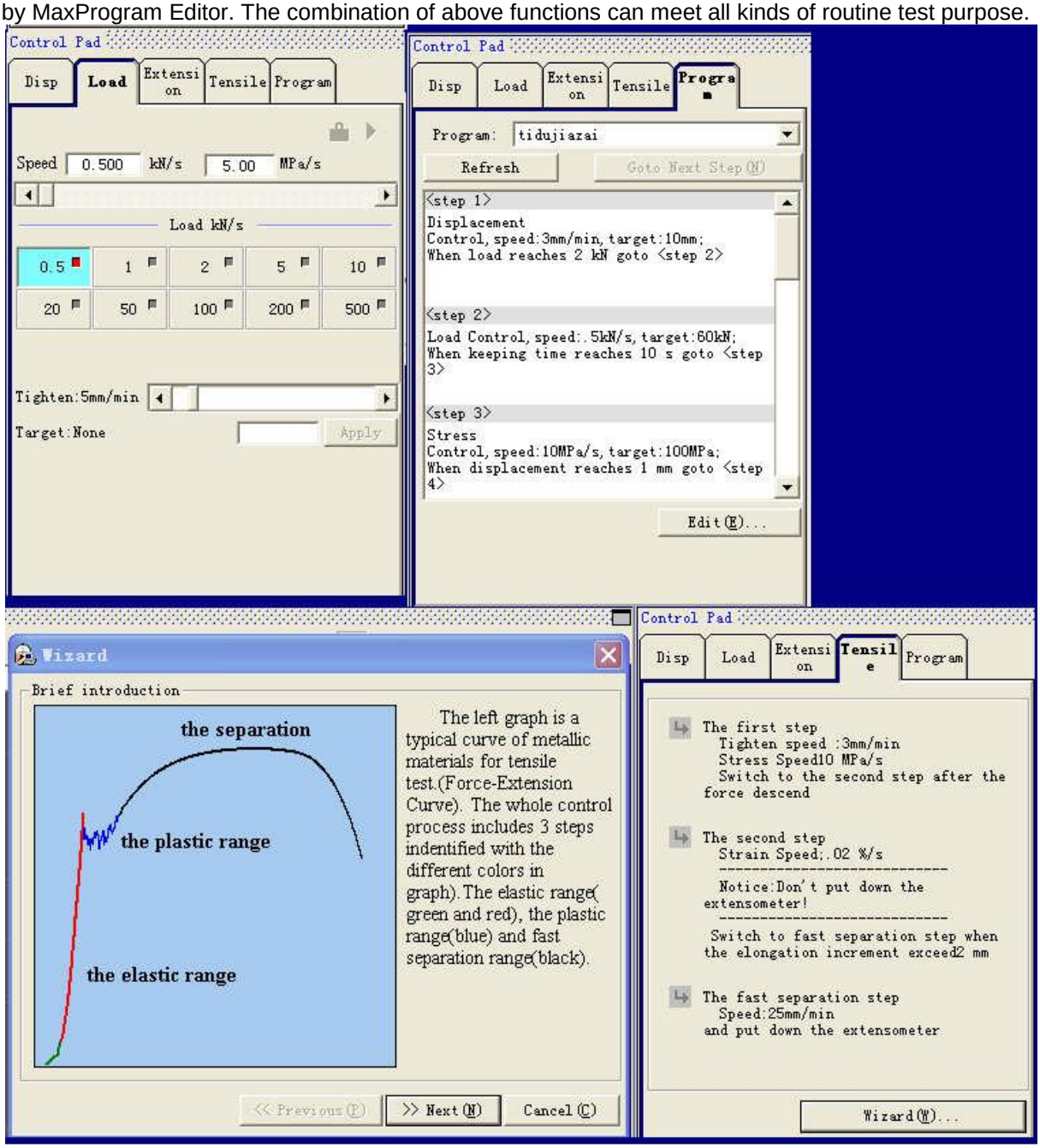
Users can modify and add own testing standards and methods.



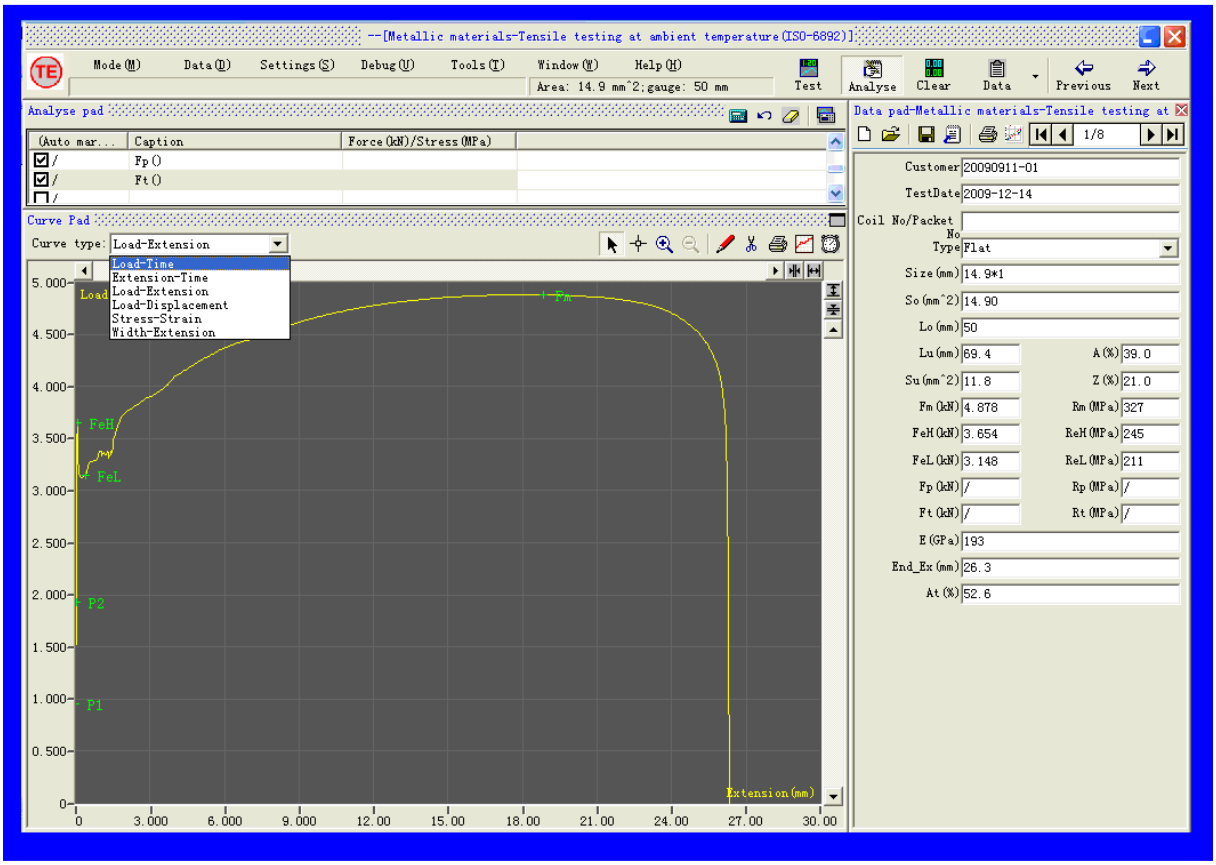


MaxProgram Editor possesses of multiple full digital control modes, i.e Displacement control, Stress (Load)
control, Strain (Deformation) control, Low cycle control. User can edit the most complex and logical procedure

by MaxProgram Editor. The combination of above functions can meet all kinds of routine test purpose.

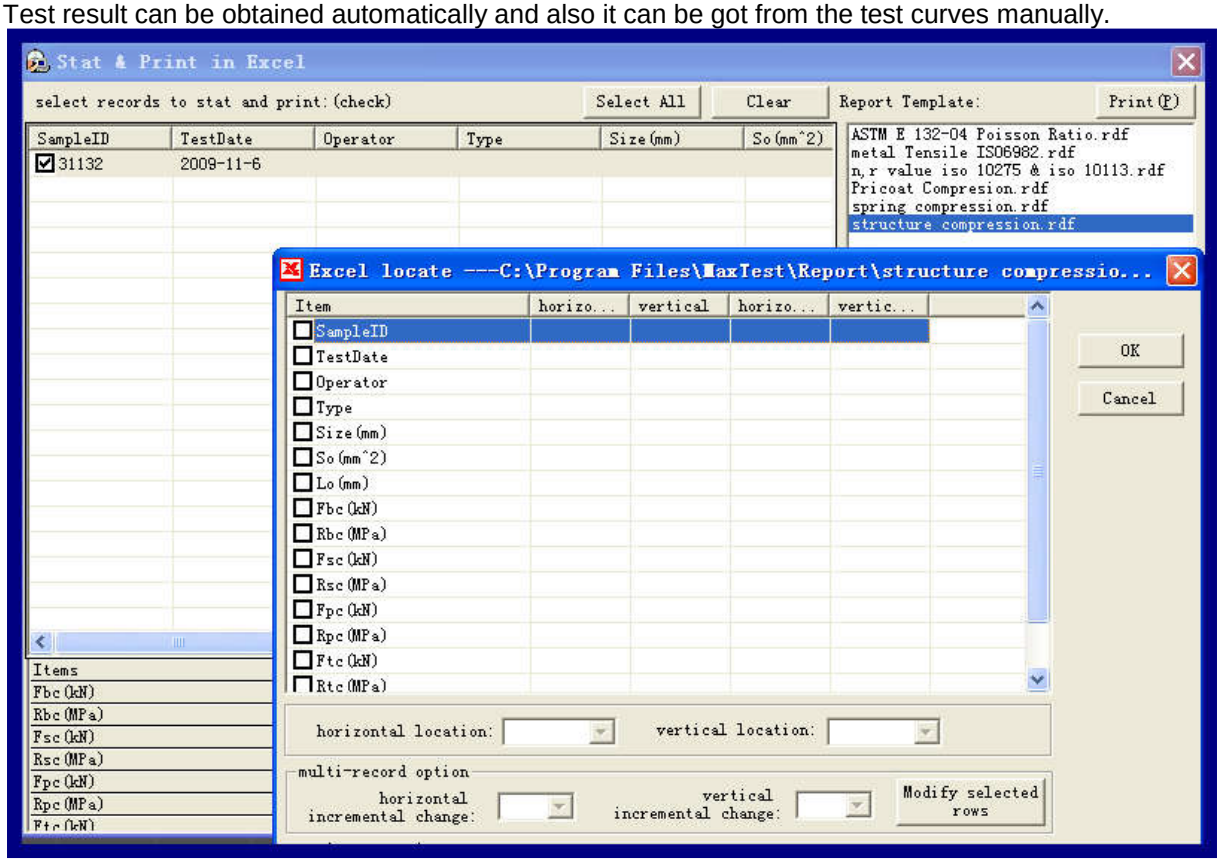


Through the Tensile Program Editor, user can setup test steps according to the requirements of standards.



Multiple curves function in real time display including Load-Extension, Load-Displacement, Stress-Strain,
Load-Time, Extension-Time, and Width-Extension.
Characteristic points such as Elastic Modulus, Yield points, Rp, Rm etc. can be marked on the curves, for a
highlighted and visual observation.

Test result can be obtained automatically and also it can be got from the test curves manually.



TE software contains all kinds of Report Templates. Customer can design various testing reports according to

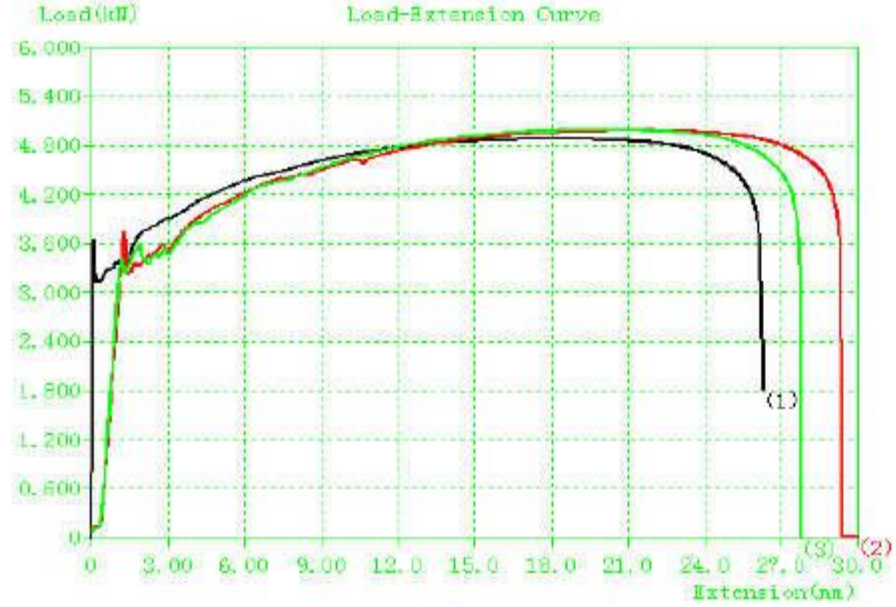
the requirements. Test result and curve can be printed in Excel or the auto-creating report template.

Metallic materials -- Tensile testing at ambient temperature

ISO 6892 : 1998

TestDate	2009-9-11	Operator	LW
Temperature	20℃	Size(mm)	14.9*1
Lo(mm)	50	So(mm^2)	14.9

PrintID	SampleID	Rm(MPa)	ReH(Mpa)	ReL(MPa)	Rp(MPa)	E(GPa)	A(%)	Z(%)
1	QD01	327	245	210	233	193	39	21
2	QD02	334	251	223	234	198	42	23
3	QD03	335	240	229	228	205	38	27
4								
Max value		335	251	229	234	205	42	27
Min value		327	240	210	228	193	38	21
Average value		332	245.3333	220.6667	231.6667	198.6667	39.6667	23.667



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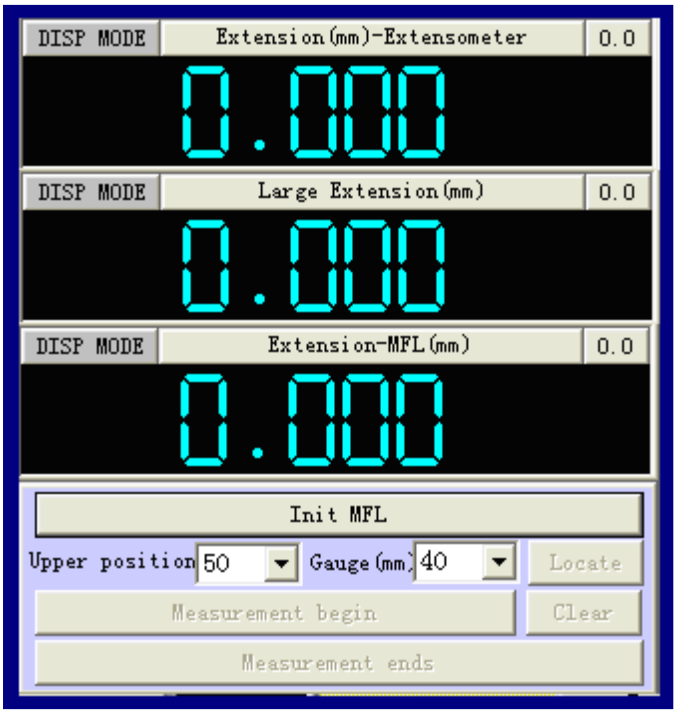
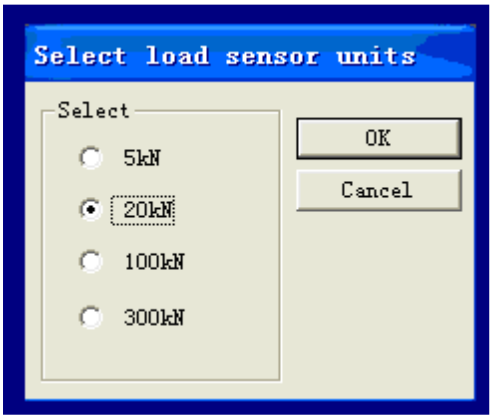


Beside the clip-on Extensometer, TE software supports Long Travel Extensometer, Full Automatic Extensometer, video Extensometer, laser Extensometer, and it can be added eight Extensometers at most.



TE software supports four load cells.