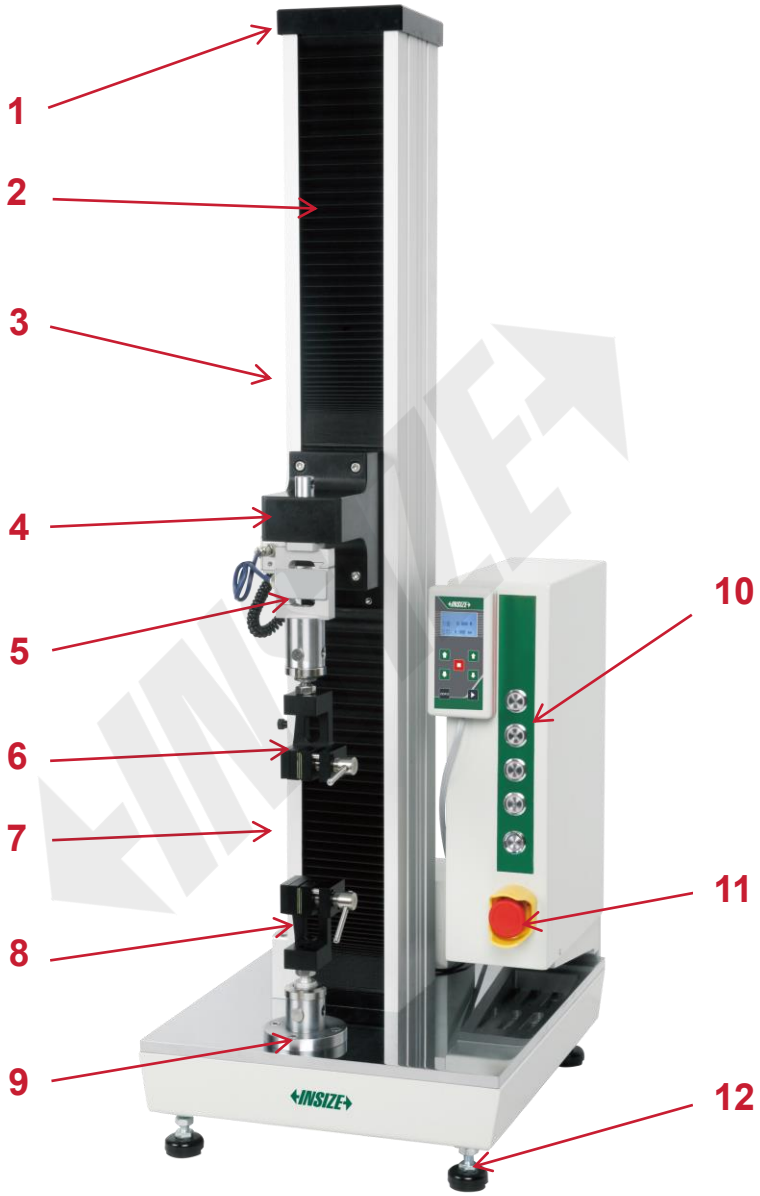
UTM-Z Series

Electronic Universal Testing Machine
Operation Manual

Contents

1 System description and terminology

1.1 Components



Equipment Components

No.	Components
1	Top Plate
2	Ball Screw Safety Curtain
3	Upper Limit
4	Crossbeam
5	Force Sensor
6	Upper Fixture
7	Lower Limit
8	Lower Fixture
9	Base
10	Switch
11	Emergency Stop Button
12	Foot Foundation

1.2 Description of terminology

Terminology	Description
Limit	Limit the crossbeam displacement limit, when the crossbeam moves, the stopper will stop moving if it touches the limit, preventing the operator and equipment from being hurt by accidental crossbeam movement.
Force Sensor	For equipment acquisition of force values.
Fixture	For clamping specimens during testing.
Emergency Stop Button	When an unsafe condition exists and the crossbeam needs to be stopped immediately it is necessary to use the button.
Foot Foundation	Located at the bottom of the base for levelling the machine.
Specimen	The specimen to be tested.
Software	Depex test software, which controls the test system, runs the test and generates the test data.
Test Methods	In the test software, the test method contains a set of defined parameters with which the system performs the test, analyses the test data and generates calculations.

2 Security

2.1 Rapid crossbeam movement

Finger or hand squeeze hazard

This hazard refers to the merging of fixtures and fixtures together due to rapid movement of the crossbeam, thereby crushing hands or fingers. For example, an operator inadvertently commands the system to tap or return while his or her hands are still in the test zone.

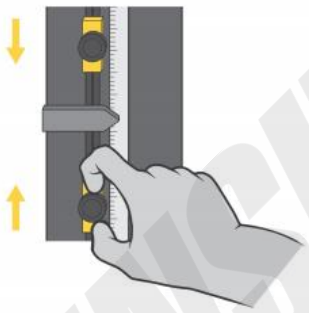
Suggestion：

-The operator does not need to reach into the test area while the crossbeam is moving.

-In the test software, reduce the speed of the tapping movement or or set a lower force protection threshold.

-Set the appropriate travel limits each time the fixture is changed and the crossbeam is adjusted.

-Use a sample insertion tool to ensure that your fingers do not get into the spaces between the firmware.



2.2 Effects of fibres in broken specimens

Danger of flying fibres

This danger refers to brittle or composite samples that will explode on fracture.

Less dangerous flying fibres (e.g. sample dust or fibres).

Suggestion：

-Use personal protective equipment (e.g. goggles).

2.3 Intrusion of solid particles

Solid particles and other debris, especially electrically conductive or abrasive dust (e.g. metal shavings, carbon-based composite fibres), may damage the test system if allowed to accumulate. If the test application generates debris, follow these special precautions:

Suggestions:

-Clean the test system and adjacent areas frequently with a vacuum or soft brush to prevent debris build-up.

-Thoroughly clean all exterior surfaces before performing any maintenance. This prevents debris from falling onto the internal components of the test system.

2.4 Liquid intrusion

Any spillage of liquid onto the test system may result in damage to the equipment. Accidental liquid spills are not hazardous to the operator if handled properly.

Use extreme caution when using any accessory that could spill liquid onto the test system.

If a liquid spill occurs:

Recommendations:

-Stop the test immediately and power down the unit. Unplug the power cord (if applicable).

-Clean up any liquid spilled on the outside of the unit as much as possible. Make sure to check the rubber gasket underneath (if present) and any fitted accessories.

Continuing to operate the test system after liquid has entered the test system may cause danger to the operator and additional spare damage.

-The test can only be resumed after the liquid spillage has been properly cleaned up.

2.5 Other considerations

DANGER! Do not remove the cover of any part of the system unless instructed to do so by our professional staff.

Dangerous voltages and rotating parts are present inside the machine that could cause personal injury or damage to the equipment.

Electric shock hazard! For safety and electromagnetic compatibility, the factory outlet must be a 3-wire grounded outlet. The grounding must be a low impedance ground in accordance with national or local regulations.

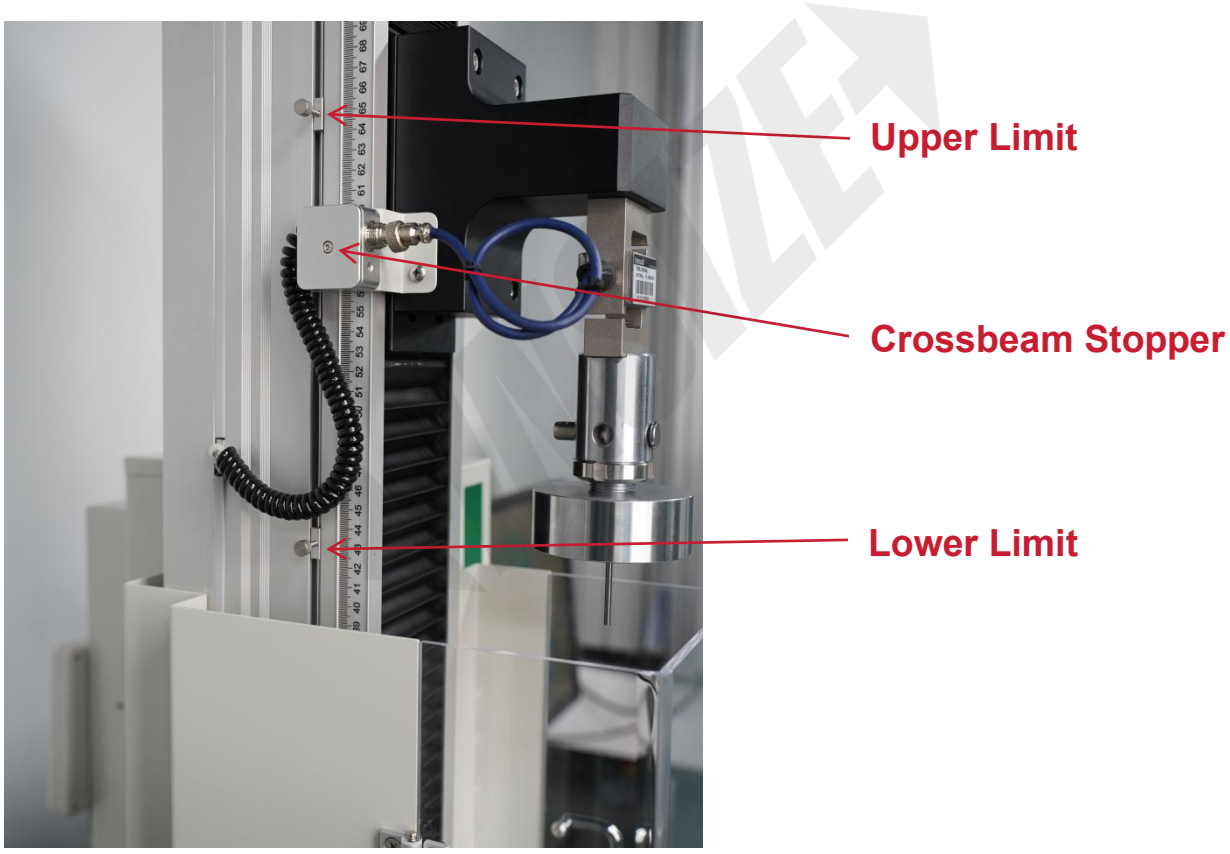
DANGER! Determine the voltage before switching on the power supply. If the connected power supply exceeds the configured voltage by more than 15%, the device may overheat or be damaged!

3 Equipment adjustment

3.1 Limit adjustment

Although Depex allows you to set the travel limits in software, the crossbeam travel limits must also be set in hardware. These hardware limit stops provide absolute travel limits and operate independently of the software.

The crossbeam limit stops are two adjustable blocks mounted on the limit switch lever inside the machine column. After loosening the screws by hand in an anti-clockwise direction, the screws can be moved freely on the travelling limit lever, which can be adjusted and then tightened in a clockwise direction. When the crossbeam movement exceeds the maximum limit, the crossbeam stopper will touch one of the limits and activate the limit switch, thus stopping the movement of the crossbeam.

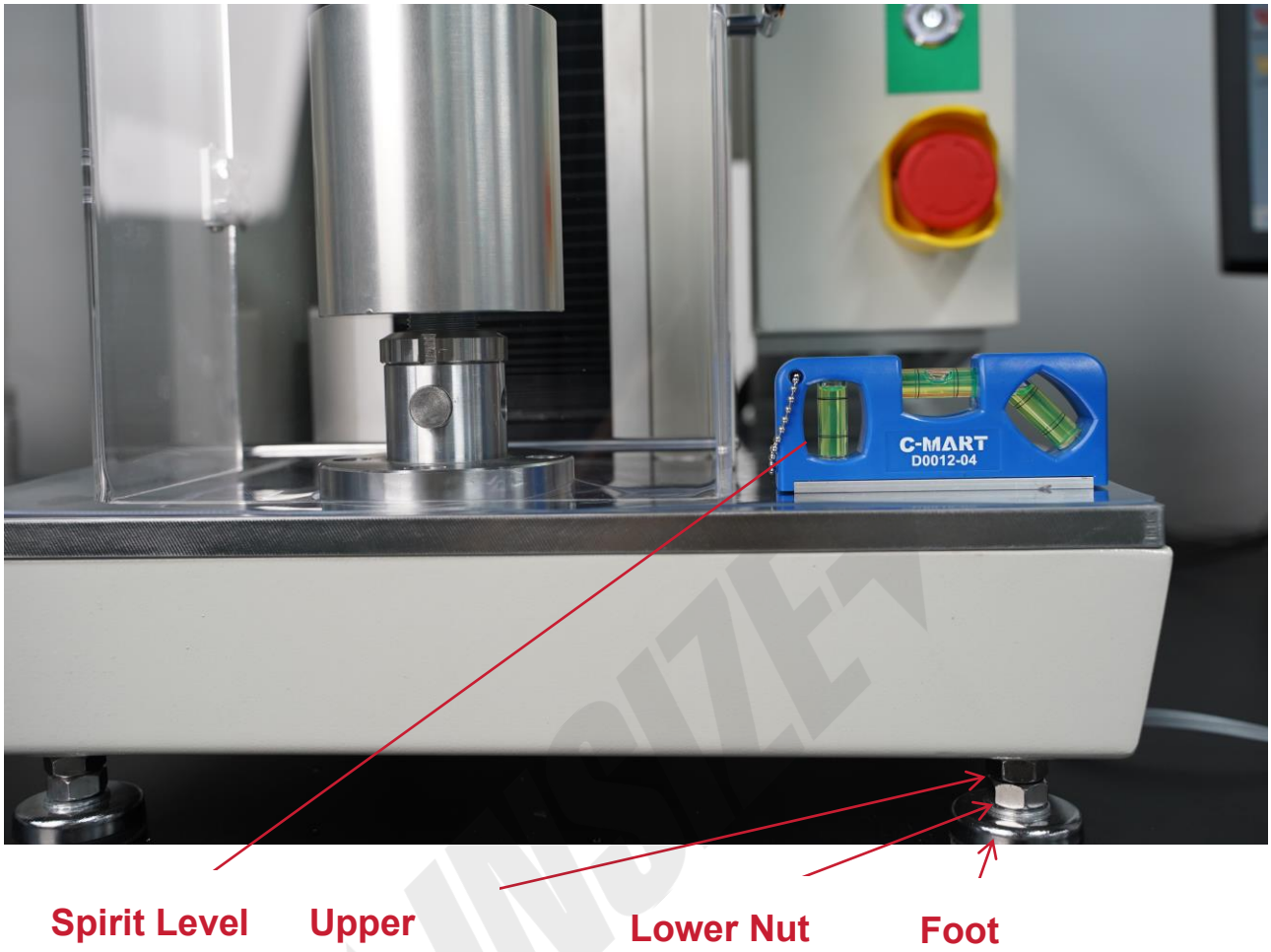


3.2 Adjustment of the Foot Foundation

After positioning the rack ready for installation, the foot foundation needs to be adjusted according to the level. This prevents the base from rocking and provides a levelling test for more accurate results.

Adjustment steps are as follows:

Use a spanner tool to tighten the upper nut of the foot until it is tight with the lower nut, turn the lower nut clockwise to extend the foot, and counterclockwise to select the lower nut to retract the foot, and then lock the upper nut upwards after adjusting it to a suitable position.



DANGER! When adjusting the feet, do not adjust them too much in one direction to prevent the equipment from tilting or falling over, which may cause injury or damage to the equipment.

4 Functions of the control

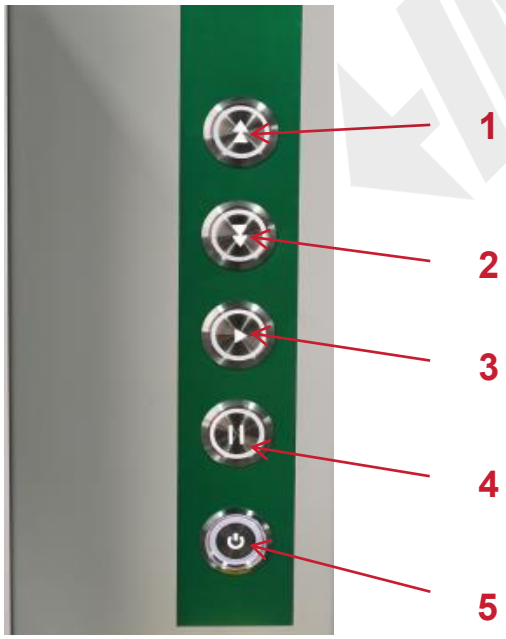
4.1 Emergency Stop Button

The ‘Emergency Stop Button’ is a large round red button on the test system. If any of the following conditions occur, the button can be pressed to stop the test as soon as possible:

-The safety of the system operator may be compromised
-Possible damage to specimens, racks, or test fixtures.

When the Emergency Stop button is pressed, the unit will immediately go offline, and a right turn will cause the button to spring back.

4.2 Rack control buttons



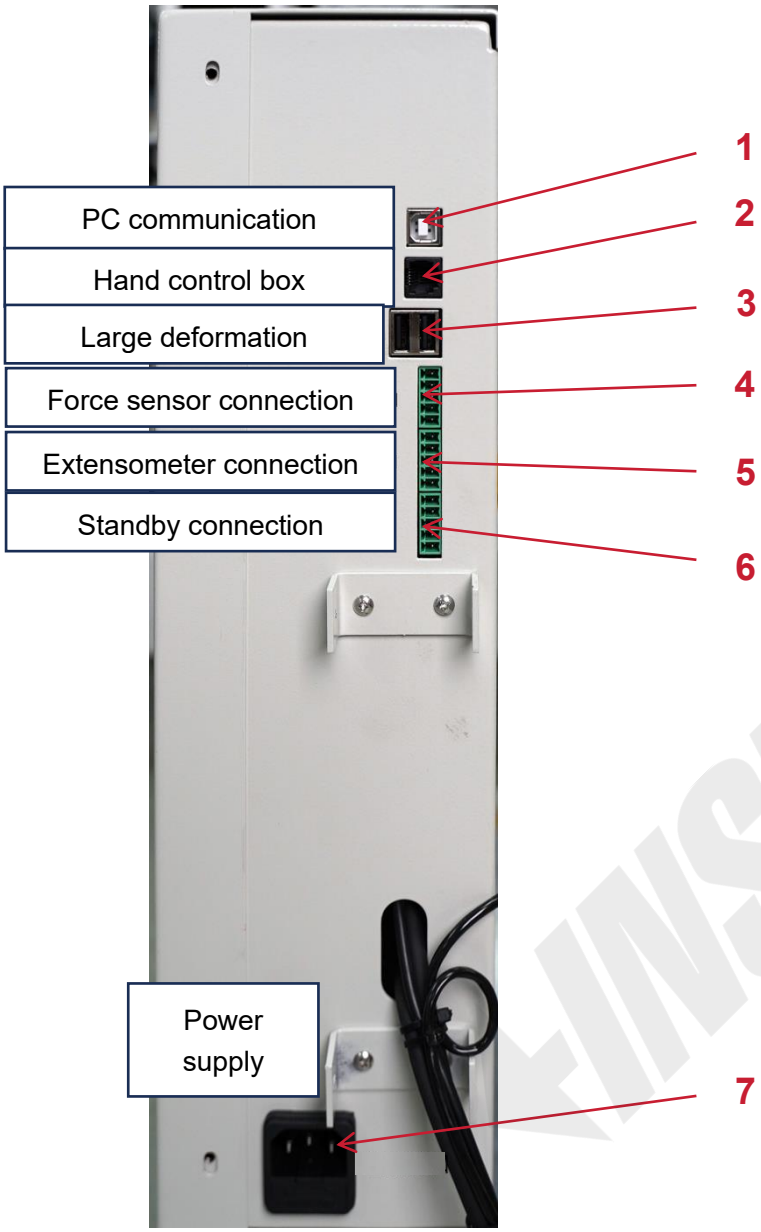
No.	Description
1	Tap the button, the crossbeam moves up, the default speed is 300mm/min, which can be modified in the software.
2	Tap the button, the crossbeam moves dowm, the default speed is 300mm/min, which can be modified in the software.
3	Tap the button to start the test
4	Tap the button to stop the test or stop the crossbeam from moving.
5	Equipment power switch

4.3 Hand control box button

The hand control box control is independent of the software control, and can be used without the online state.

No.	Description	No.	Description
1	Online state	6	Tap the button and the crossbeam moves up slowly
2	Force value display	7	Tap the button and the crossbeam moves down slowly
3	Displacement display	8	Tap the button to stop the test or stop the crossbeam from moving.
4	Tap the button and the crossbeam moves up quickly	9	Display Clear
5	Tap the button and the crossbeam moves down quickly	10	Tap the button to start the test

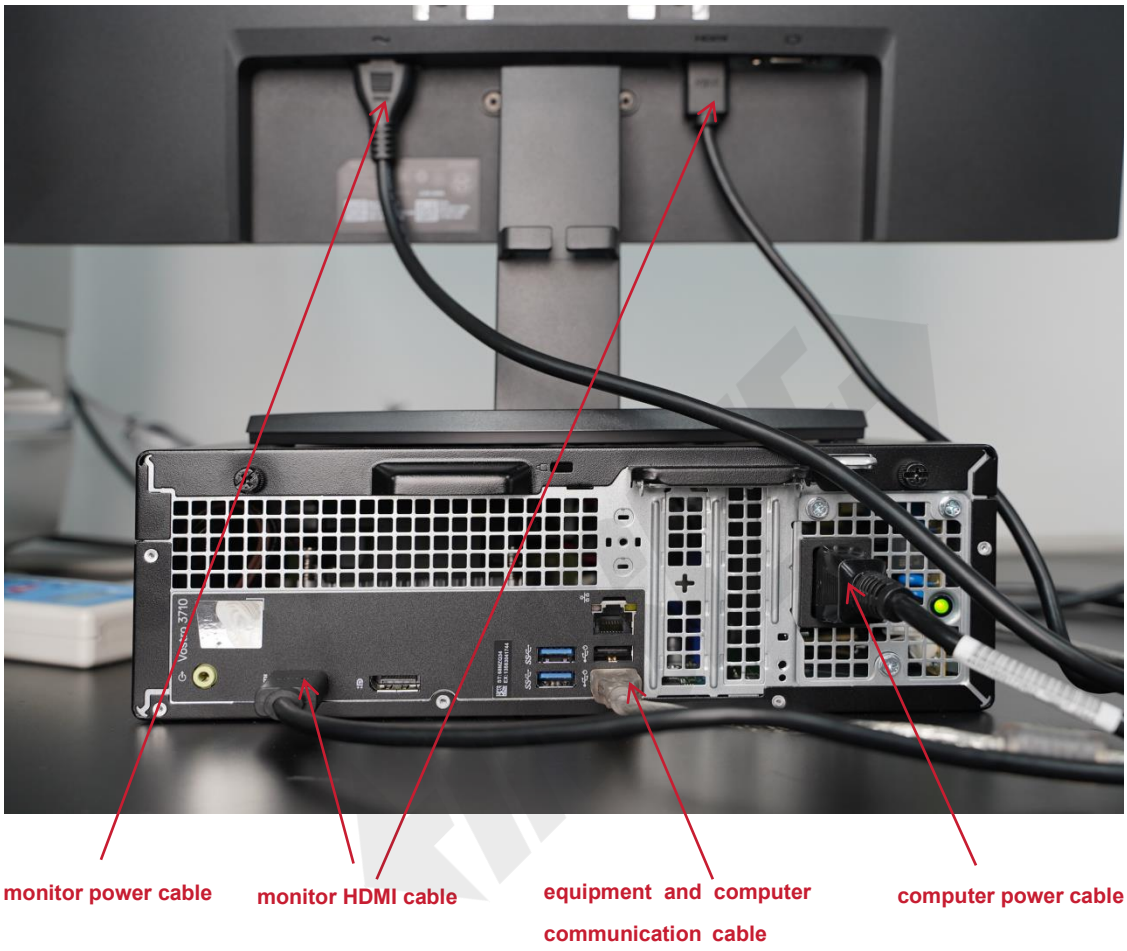
5 External connections



No.	Description
1	Computer communication connection, the other end is plugged into the computer USB port, after the device is powered on, it can be online in the software.
2	Hand control box connection for external hand control box.
3	Large deformation interface, two interfaces for receiving two encoders for large deformation respectively.
4	Force sensor connection for the device to receive force values.
5	Extensometer connection for receiving the value of the extensometer.
6	Reserved for further expansion of use.
7	Power supply for supplying power.

6 First time power on

After adjusting the level of the equipment, you need to connect the equipment and computer communication cable, computer and monitor HDMI cable, and equipment, computer, monitor a total of three power cables connected to the socket, connected to the keyboard and mouse, and finally press the equipment and the computer's power switch, that is, to complete the power.



Electric shock hazard! For safety and electromagnetic compatibility, the factory outlet must be a 3-wire grounded outlet. The grounding must be a low impedance ground in accordance with national or local regulations.

DANGER! Determine the voltage before switching on the power supply. If the connected power supply exceeds the configured voltage by more than 15%, the device may overheat or be damaged!

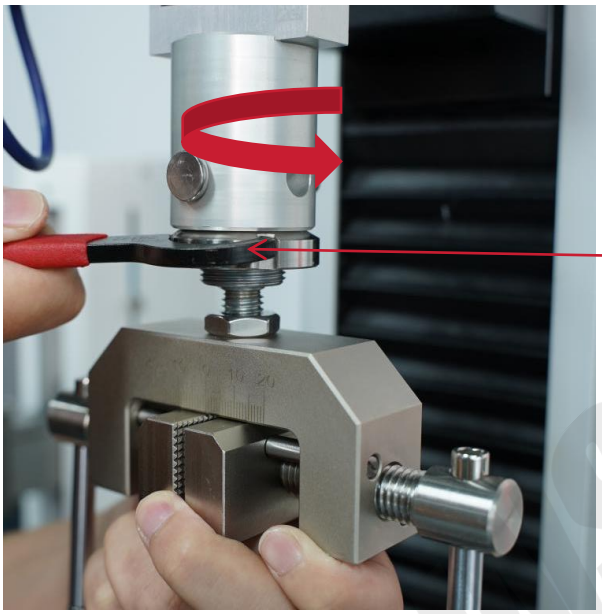
7 Replacement

7.1 Replacement of fixtures

In order to meet the testing needs of different specimens, it is often necessary to change different fixtures to test specimens of different shapes or materials.

Replacement of the above fixture as an example:

1 One hand holding the fixture, the other hand using the crescent spanner clockwise rotation lock nut



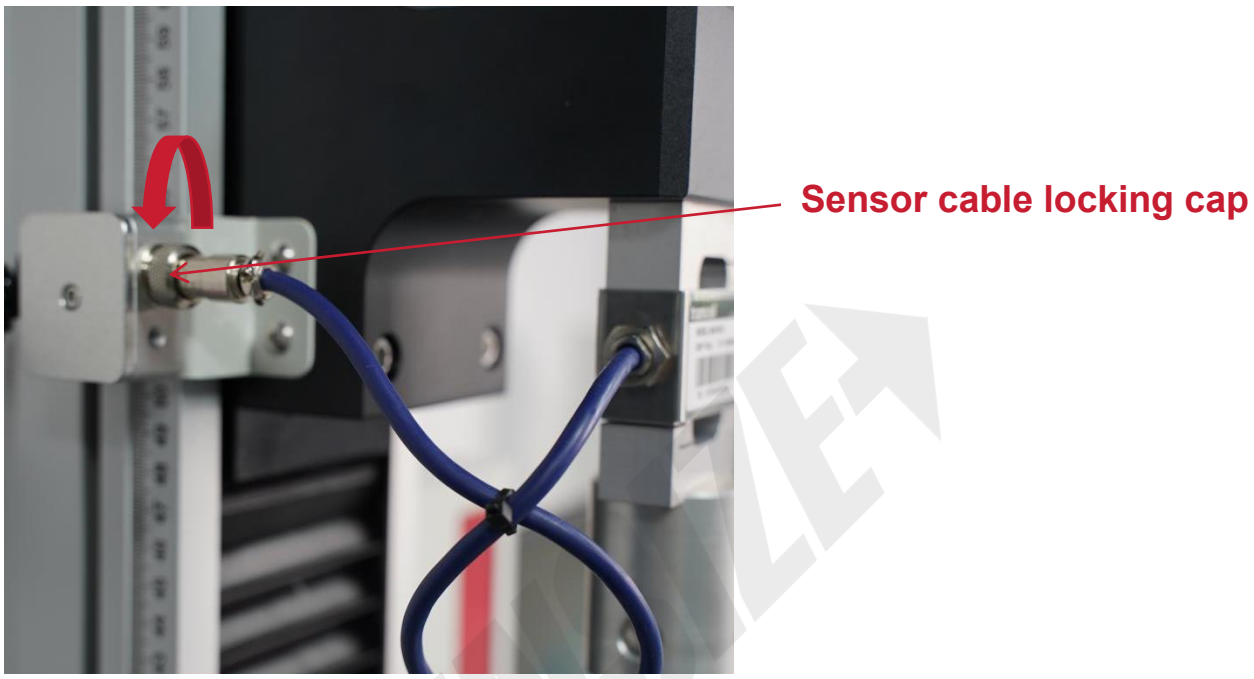
2.After the lock nut is loosened, pull out the bolt to remove the fixture to be replaced.

Install the fixture in reverse order. For small range sensors, do not use excessive force to prevent damage to the sensor.

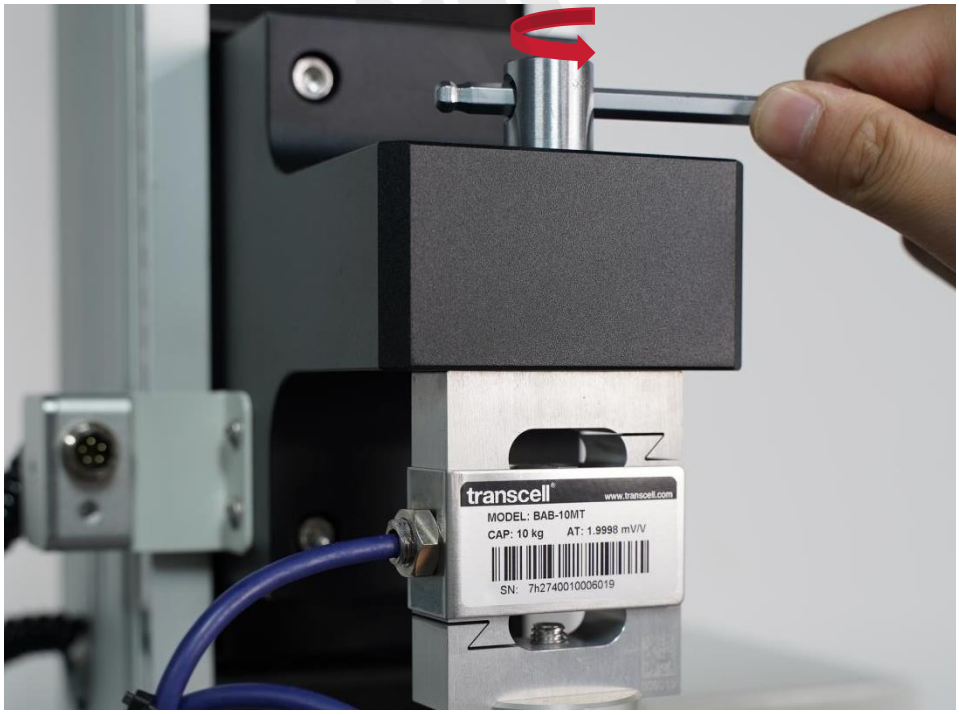
7.2 Replacement of sensor

In order to meet the testing needs of different specimens, it is necessary to choose transducers with different ranges. Typically, transducers with large ranges are able to measure larger force values, and transducers with small ranges are more accurate.

1. After loosening the locking cap of the sensing connecting wire counterclockwise, pull out the sensor connecting wire outwards.

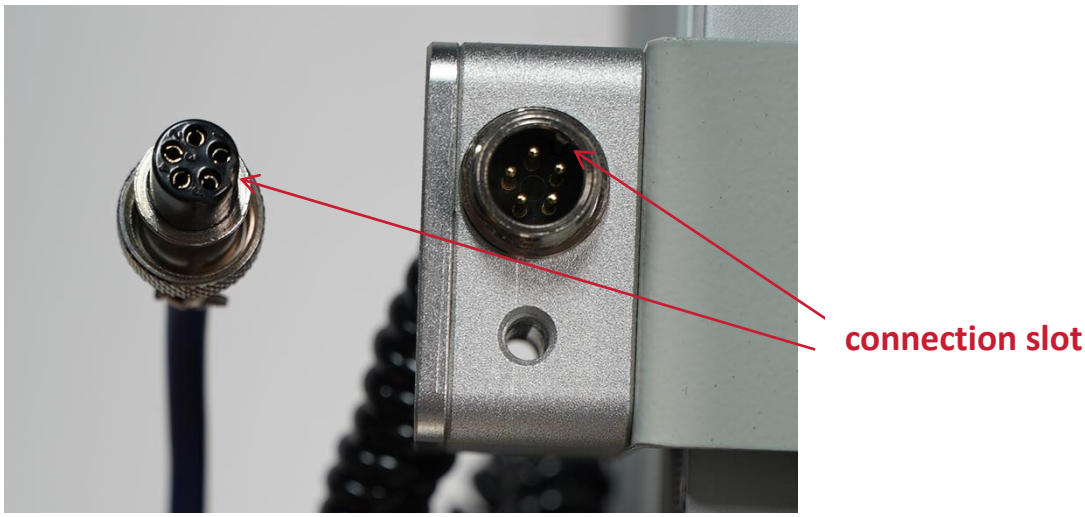


2.Use a tool to loosen the locking screws on the top of the beam counterclockwise and remove the sensor once they are completely loosened.



The installation of the sensor steps are reversed and require additional attention:

1.Insertion of the sensor connection cable requires alignment of the connection slot.



2.The replacement sensor must be a sensor that has been calibrated; after replacing the sensor you need to reselect the sensor and then on-line. If it is not calibrated, you need additional calibration steps.

3.If the sensor is a small range sensor, please do not use excessive force to prevent damage to the sensor.

8 Software Introduction

1 The software can solve a multitude of testing for various materials, industries, and components in accordance with international standards, such as ASTM, ISO, EN, JIS and more. And can make special test methods according to user requirements.

2 Display the real-time maximum force, the accuracy of the display value can be set according to need;

3 Display the real-time maximum deformation, the accuracy of the display value can be set according to need

4 Can view any one of force-time, deformation-time, displacement-time, stress-time, strain-time, force-deformation, force-displacement, stress-strain curves. The curves can be zoom in and out, moved and traversed.

5 The test results of elastic modulus (linear regression fitting), yield strength and plastic extension stress are automatically calculated at the end of the experiment. The software has pre-edited common parameters, but the user can define special parameters and edited the formula freely. On the basis of automatic analysis, user can correct the analysis results manually to improve the accuracy;

6 All the test date and curves will be saved to database automatically.

7 The test report can be edited by Microsoft word or excel, and can be printed.

9 Installation and Run

9.1 Run environment

1 Computer hardware configuration

1) CPU frequency more than 1000MHz
2) Memory more than 1GB
3) Hard disk more than 40GB
4) Graphics card resolution over 1024×768, memory more than 16MB
5) Various printers

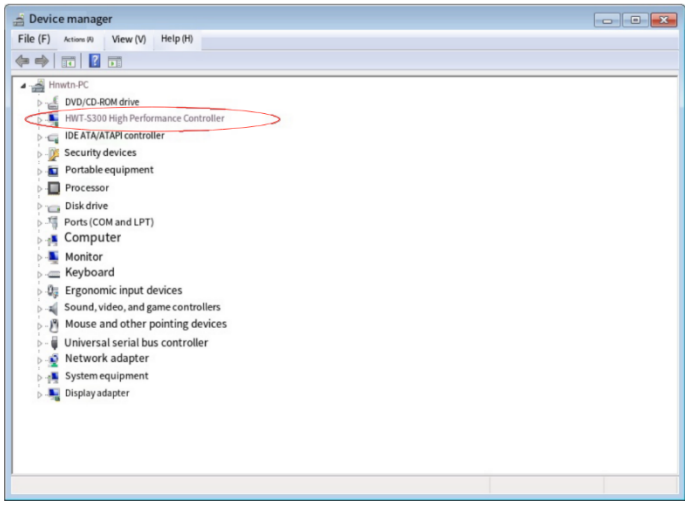
2 Computer operating system

Windows XP/vista/Win 7/Win10.

9.2 Installation

9.2.1 Hardware

The device connects with computer by the USB cable, and power –on. If the device be used first time, need to install the device driver. When the driver installation is complete, device manager will appear controller name. As the below picture shows.

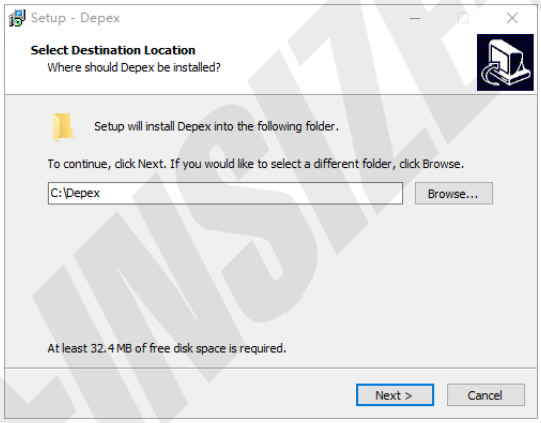


9.2.2 Depex Software Installation

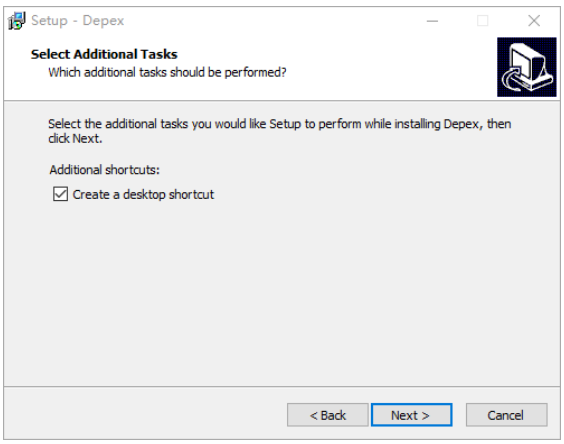
Double-click the file with the .exe extension

Depex.exe

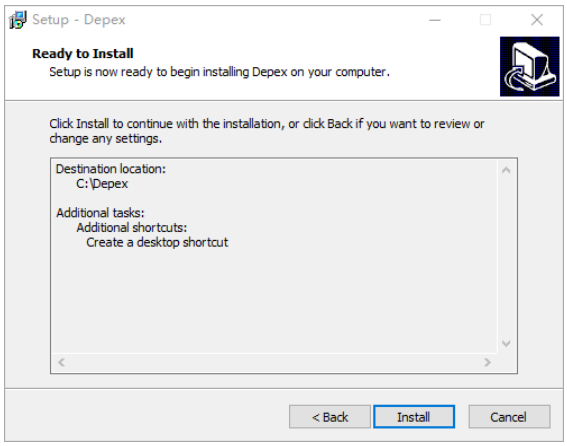
Select the installation folder, as the following picture shows, click[Next]

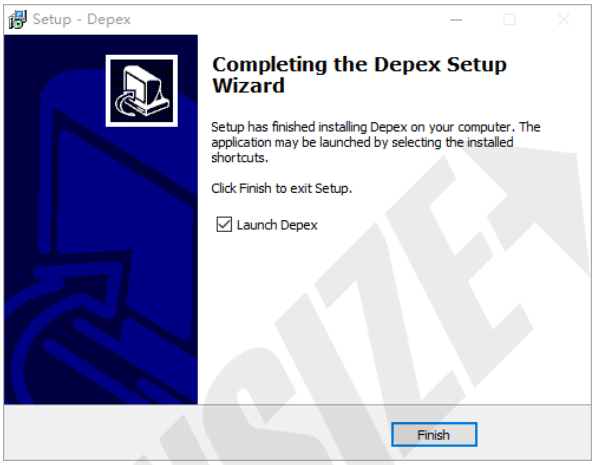


Click [Next]



Click [Install]





Install complete.

10 Software Operating Instructions

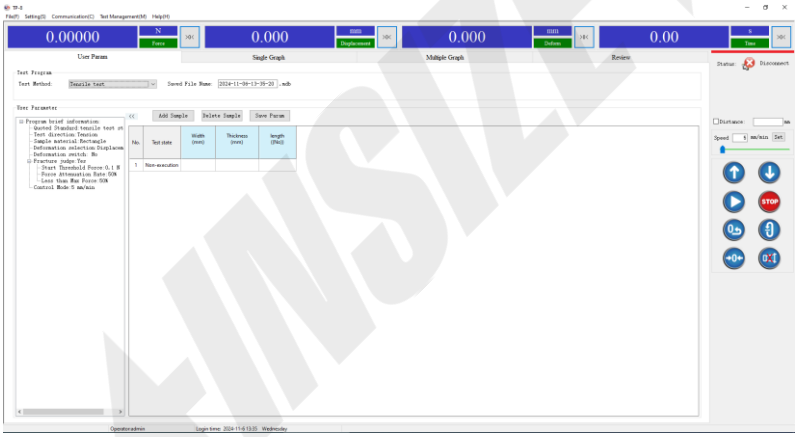
10.1 Software Features Overview

Software basic functions: can be test comprehensive material properties parameter, such as Elastic Modulus (E), Upper Yield Strength, Lower Yield Strength, Tensile Strength (Rm), Specified Plastic Extension Strength, Specified Total Extension Strength, Residual Extension Strength Specified, Nonproportional Extension Force (Fp0.2), the provisions of the non-proportional extension strength (Rp0.2), the maximum force (Fm), the maximum total force extension (ΔLm), the total elongation at break, energy absorption, peel force, peel strength and so on.

Function	Description
Online / offline	Equipment and computer communication connection.
User Management	Multi-user Permissions setting.
Hardware parameter setting	1.Edit the host parameters, sensor, motor driver parameters. 2. Manage multiple sensor information.
Sensor parameters setting	Sensor orientation identification, calibration, verification, switching and more.
test standard setting	1.Edit the test standard and parameters. 2.In accordance with international standards, such as ASTM, ISO, EN, JIS and more.
Test Program	1. Test program can be exported and import ed into another computer. Combined the force control, displacement control, deformation control and other control and can meet any static test requirements.
Display graph	1. Display Single Graph: can be display any one graph of Force - Time, Deformation - Time, Displacement - Time, Stress - Time, Strain - Time, Force - Deformation, Force - Displacement, Stress – Strain, etc. 2. Display multi-graph: for analysis and compare, software can display any three groups graph of the following graph Simultaneously, such as force-time, deformation-time, displacement-time, stress-time, strain- time, force- deformation, force- displacement, stress- strain, etc.
Test results and curve analysis	1. Curve coordinates can random switch; curves can be moved and zoom in or out freely.

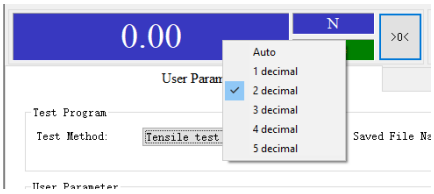
	2. Traversal the curve can view test data 3. The result can be displayed, modified and saved on the curve.
Test report format	The test report format can be edited by Microsoft word or excel
Test data management	1. Test data can be inquired, deleted, saved and can be continued the unfinished batch test.
Relationship with the manual remote control	The manual remote control functions the same as the software motion control.
Encryption	Encryption tools can set the software expiration date.
Parameters unit	User can add custom units.
Rounding	The result data can be rounding.

10.2 Software function introduction

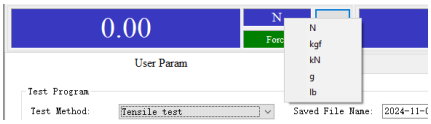


10.2.1 Value display of max load and more

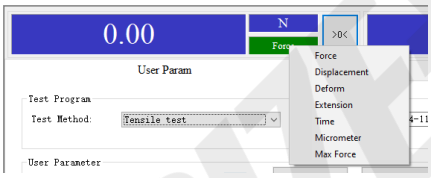
10.2.1.1 Click the right mouse button on the console and select the number of decimals, the selection will be automatically saved



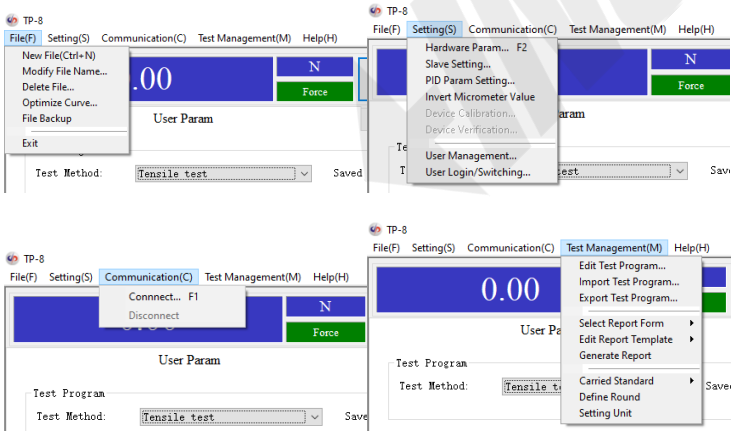
10.2.1.2 Unit area window Click the right mouse button on the unit console to select the unit, the selection will be automatically saved. The unit type can be added in the unit setting menu.



10.2.1.3 Click the right mouse button on the parameter console to select the parameter, the selection will be automatically saved.

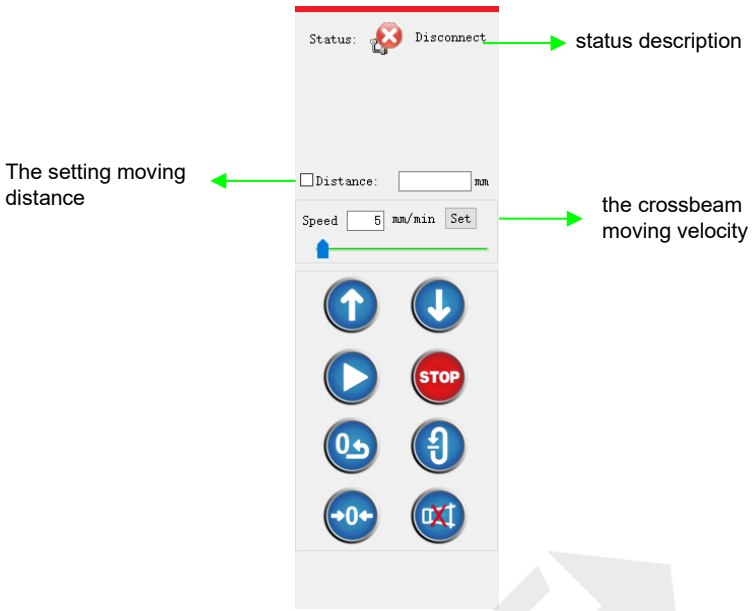


10.2.2 Main menu



Menu can set the information of equipment hardware, hand control, PID, test standards, rounding, parameter units, etc. User can set the hardware parameters, hand control parameters, PID parameters when the equipment offline. And can calibrate the equipment when online. Whether on-line or off-line, all parameters of the test management menu can be set up.

10.2.3 Test control and status description



The velocity is mean the crossbeam moving velocity, velocity unit is mm/min, The velocity setting can change moving velocity for loading and unloading specimens easily.

Attention: When running the test, if setting the velocity, it will change the test control mode into displacement control mode, until the test is over.

The setting moving distance which is the crossbeam moves to the setting distance and stop.

 [UP] button - -move up at the set speed;

 [DOWN] button -- move down at the set speed;

 [STOP]button - -stop the test or stop moving crossbeam;

 [RUN] button - -to start the test;

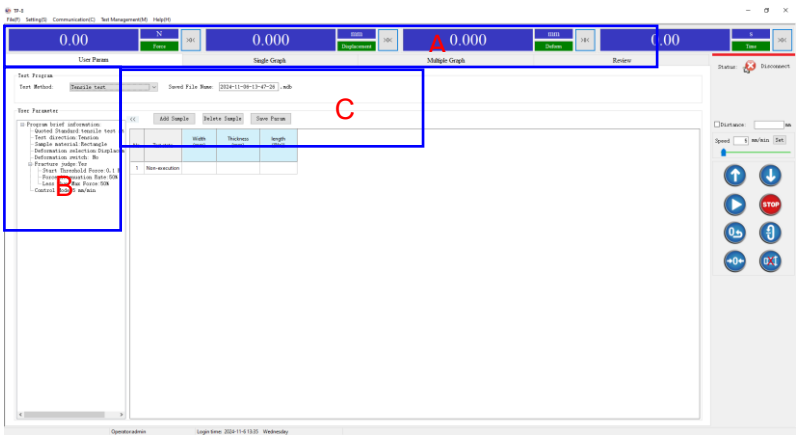
 [Return Zero] button - - back to force zero;

 [Return Position] button - - Return to the zero position

 [ClEAR] button - -the current display value is clear to zero;

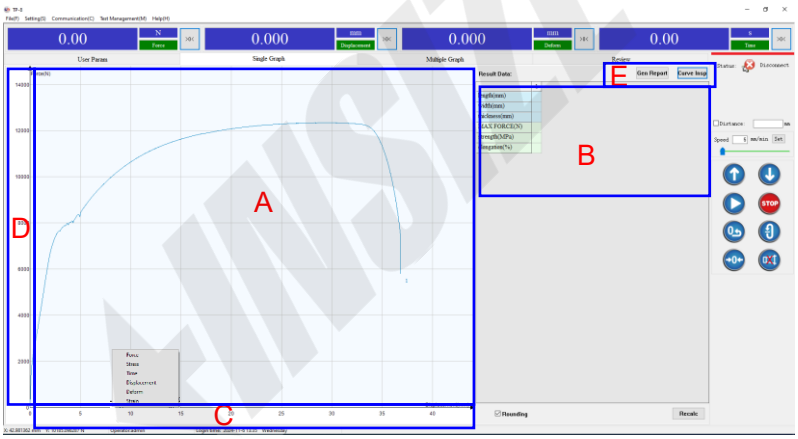
 [Extruded Extensometer] button - -Extensometer removed during small deformation test

10.2.4 User input



Select the pre-configured test method in area A, and show the brief information of the selected test method shows in area B. User input specimen information in area C.

10.2.5 Single Graph---Result



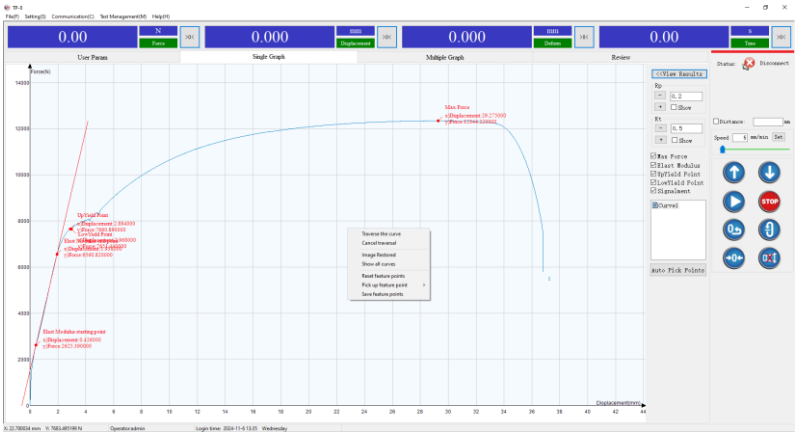
A single graph shows only a pair of X, Y coordinates of the curve.

Area A is a single graph curve display area, right-click C, D area can change the X, Y-axis coordinates.

Area B is the result display area, which shows "user input parameters" (gray background) and "result parameters" (light blue background).

E zone have the [report] and [curve analysis] two buttons. Click the [curve analysis] button, User can switch into analysis interface, user also double left click switch into analysis interface.

10.2.6 Single Graph--- Analysis



In the case of a single curve display, click the right mouse button, and can curve traversal and manual take points.

Watch the curve process by the left mouse button to zoom in or restore the curve. Press and hold the left mouse button can zoom in or out. Drag to the lower right enlarge the curve. The length of the dragging area corresponds to the magnification of the horizontal axis of the coordinate system, and the width of the dragging area corresponds to the magnification of the speed axis of the coordinate system. Press and hold the left mouse button drag to the upper left to restore curve. Press and hold the right mouse button can move the curve freely.

Two ways of analysis:

1. Analysis by auto catch points

   When the test is completed, the results analysis basis on auto catches point default

2. Analysis by manual catch points

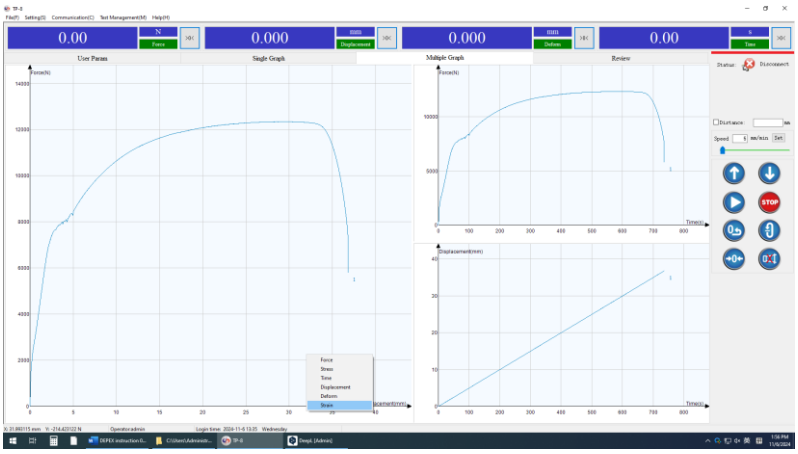
   Operating instructions:

   Step 1: Right click on the curve and select [Traversal] to enter curve traversal state. At this time, the mouse cursor becomes a cross cursor, and the cross cursor can be moved along the curve by moving the mouse. A detailed description of the corresponding point is also displayed beside the cross cursor, so that any sample data can be seen.

   Step 2: When the cursor moves to the upper yield point or other feature point, right-click and click [Feature Picking], select the feature point, then click [Save Feature Point].

   Step 3: After manually catching points and saving, if click [Auto catch points], then the result restored to calculated by automatic catch points.

10.2.6 Multi-graph display

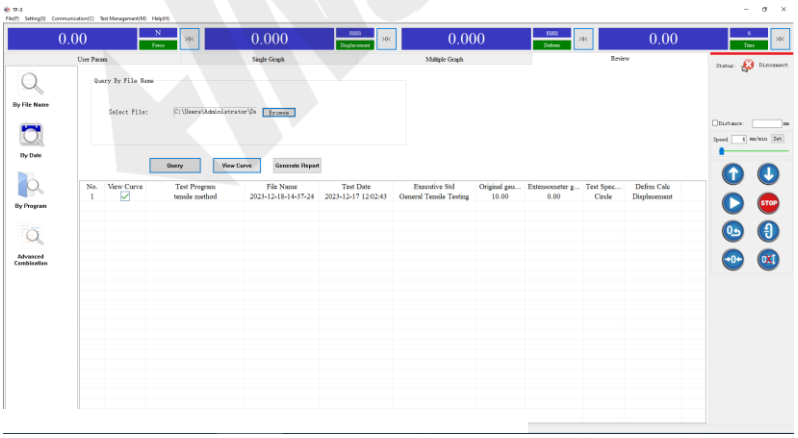


Three group of different coordinates of the curve can display simultaneous. If you need to change coordinate, right-click below the horizontal axis or the left of the speed coordinate and select to change the coordinate.

10.2.7 Inquiry

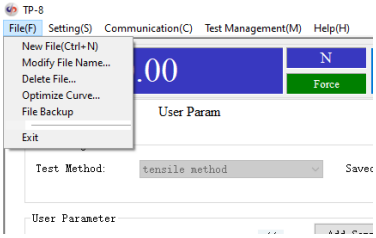
The purpose of the inquiry is to analyze and output the report on the completed test results, and to continue testing the unfinished set of tests. Inquiries can be based on the file name, date, method and other conditions.

Select the curve to be queried in the "output file" folder, and click the [Open]. Click the [Query], select the curve you want to inquire, click [View Curve] and analysis the test curve of the tested sample.



10.3 Menu Function Detailed Guide

10.3.1 File

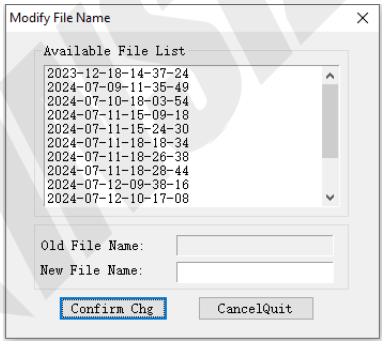


10.3.1.1 Create new file

Function: create a new group test

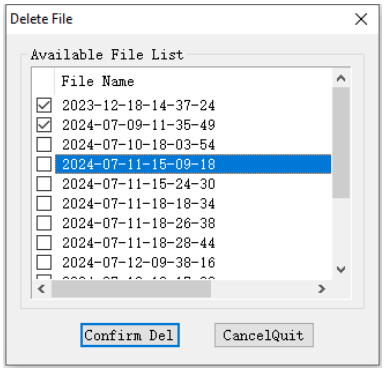
10.3.1.2 Modify the file name

Function: Modify the file name of the existing file
Modify method: In the available file list, select a file, enter a new file name, click [OK] is OK.



10.3.1.3 Delete the file

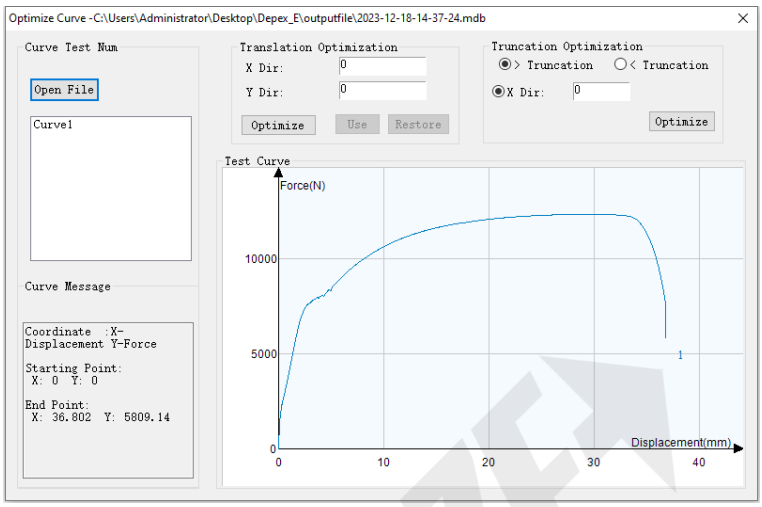
Function: delete existing data files, the file contains the original data acquisition, specimen information and the test results.



Delete method: Select the file name, and click [OK] to delete.

10.3.1.4 Curve Optimization

Function: curve can translate and modify in the X and Y directions



Method:

1. Alter coordinates of the curve

Click [Open File], select the curve, set corresponding shift value, click [Optimization] to optimize, click [Restore] to reply to the state before optimization, click [Apply] to confirm the optimization, Once click [Application] then curve cannot be restored.

2. Modify by cutting off

By removing the defect data at the beginning of the curve, in order to improve the accuracy of the results. [Less than cut off] Cut off less than the set value of the curve, [Greater than cut off] Cut off more than the value of the curve. (Note: Once the curve is optimized by cutting off, it cannot be restored)

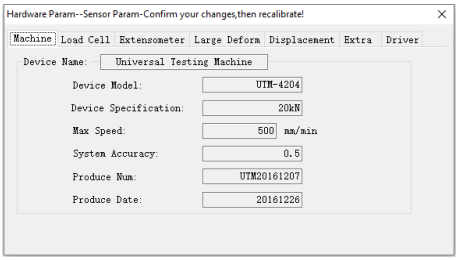
10.3.1.5 Exit

Function: quit the software

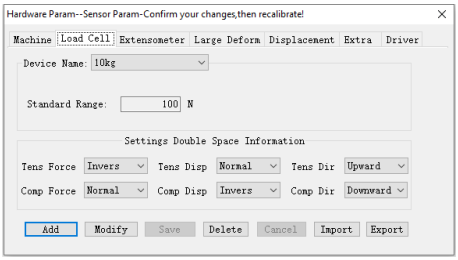
10.3.2 Parameter Settings

10.3.2.1 Hardware parameter setting

1. Equipment parameter include equipment model, specification, accuracy, Serial number and more.



2. Force sensor setting: add and set the force sensor parameter.



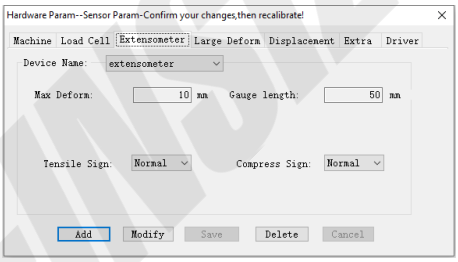
Setting method:

[Add] - Click [Add], input the corresponding information of the device and click [Save] to add the force sensor.

[Modify] - Click [Modify]to modify the existing device information, set the device information according to the test requirements, and click [Save] to update the device information. The name of this device cannot be modified.

[Delete] - Delete all the information of the existing device in the database. Be careful to delete!

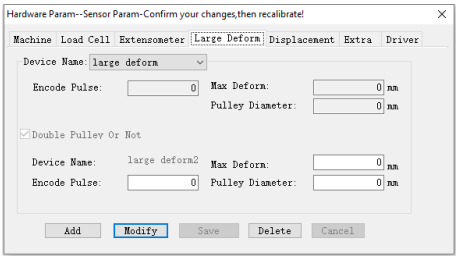
3. Extensometer setting: Adds and set the extensometer sensor parameter information



Setting method:

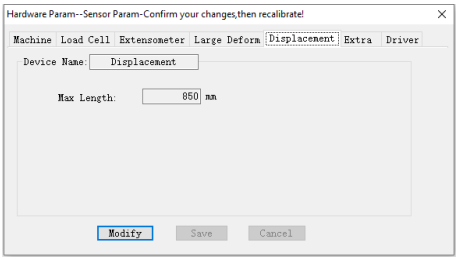
The setting method is similar to Force Sensor setting

4. Large deformation setting: Add and set large deformation sensor parameter information. Setting method is similar to the force sensor setting

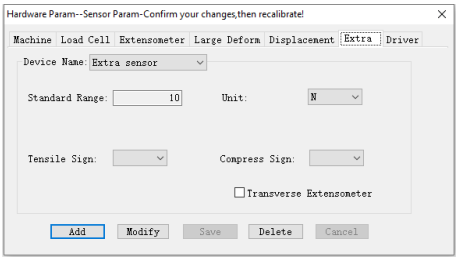


5. Displacement sensor setting: set the equipment test space

   Note: This information is set up by the manufacturer, users be careful to modify the information!

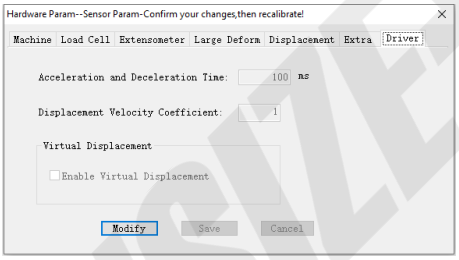


6. Expand device: Add and set extension device parameter information.

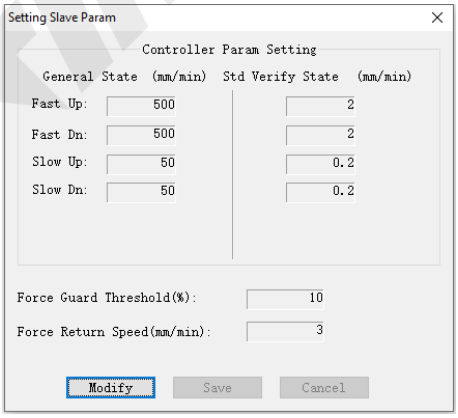


Setting method is similar to the force sensor setting.

7. Server Driver setting: set server driver information.

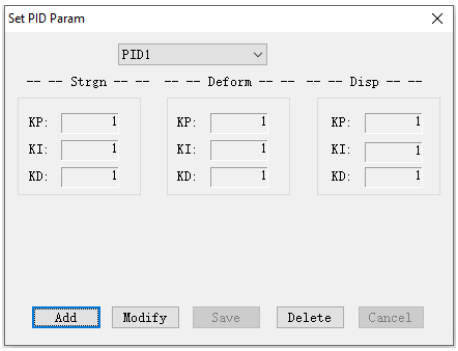


10.3.2.2 Hand control speed parameter setting



10.3.2.3 PID parameter setting

Function: Set PID parameters, which is the closed-loop control parameters.



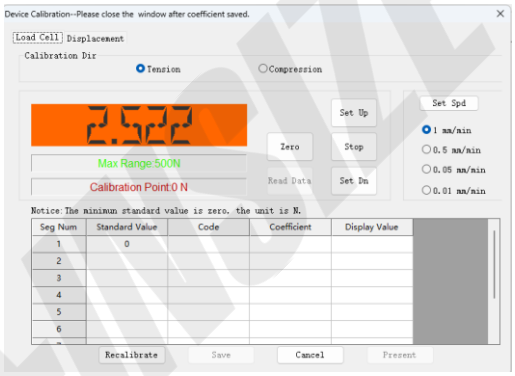
10.3.3 Equipment calibration and verification

Notes: This function is used online.

10.3.3.1 Equipment calibration

Function: modify the existing sensor calibration coefficient

1 Force sensor Calibration



Calibration method:

Step 1: Select calibration direction and select the speed, during calibration can switch the speed.

Step 2: Click [Recalibrate], then [Read Data] and [Save Coefficient] button becomes available;

Step 3: Input the standard value point to be calibrated in [Standard value] column, the first calibration point defaults to 0 and can not be changed

Step 4: Click [clear] before calibration, the first data of calibration data will be automatically filled in, calibration will start from the second paragraph

Step 5: According to calibration direction, click [Set up] or [Set down], the crossbeam will move at the speed selected, and gradually adjust the speed during operation

Step 6: When the standard dynamometer reaches the set standard value, click [read data], the data is recorded in the corresponding column

Step 7: When the calibration is completed, click [Save] to update the coefficient information

Step 8: Reconnect to validate the new calibration coefficient;

2 Displacement sensor Calibration

Calibration method:

Step 1: Click [Recalibrate], then [Read Data] and [Save Coefficient] button becomes available;

Step 2: Input the standard value point to be calibrated in [Standard value] column, set the crossbeam move speed

Step 3: Click [clear] before calibration

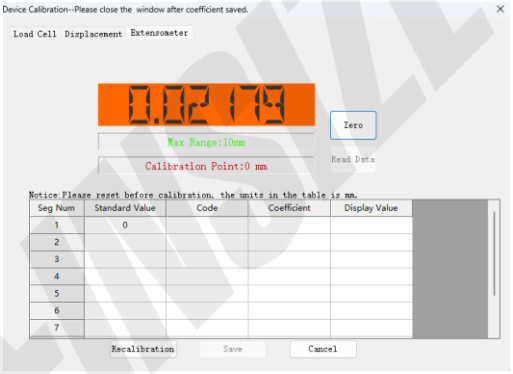
Step 4: click [Set up] or [Set down], the crossbeam will move at the speed selected

Step 5: When the standard dynamometer reaches the set standard value, click [read data], the data is recorded in the corresponding column.

Step 6: When the calibration is completed, click [Save] to update the coefficient information;

Step 7: Re-connect to validate the new calibration coefficient;

3 Extensometer calibration



Calibration method:

Step 1: Click [Recalibrate], then [Read Data] and [Save] button becomes available;

Step 2: Input the standard value point to be calibrated in [Standard value] column,

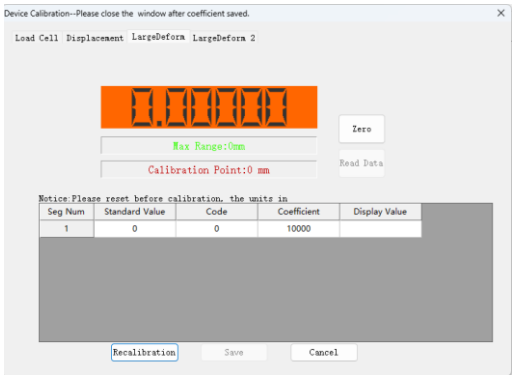
Step 3: Click [clear] before calibration

Step 4: Start equipment calibration, when the standard equipment to set the standard value, click [read data] button, then the data is recorded in the corresponding column.

Step 5: When the calibration is completed, click [Save] to update the coefficient information;

Step 6: Re-connect to validate the new calibration coefficient;

4 Large deformation calibration



If the large deformation device with double pulley, then need to calibrate the double pulley device [Large deformation 2], calibration method is same as large deformation

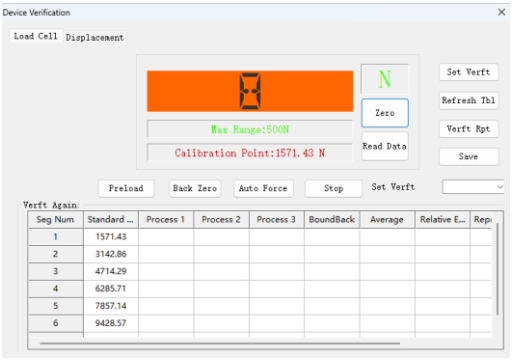
5 Expand device calibration

If the expansion interface is connected to a force sensor, the calibration method and force sensor calibration method is the same, if the expansion interface is connected to the deformation sensor, the calibration method and deformation sensor calibration method is the same

10.3.3.2 Equipment verification

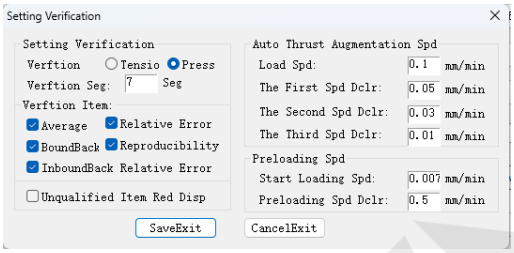
Function: Verify the equipment calibration coefficient accuracy

1 Force sensor verification



Verification method:

Step 1: Click [verification setting] button to set the verification information



[Save and Exit] If you find that the list of verification settings is not updated in time, please click "Refresh" button.

Step 2: Set the standard value of each section to be verified;

Step 3: Click [Auto load force] to start verification. When the standard device reaches the set standard value, click [Read Data] button, then the data of this time is recorded in the corresponding data column;

Step 4: When verification is completed, click [Return zero] restore equipment to the initial force zero;

Step 5: Repeat step 3 and step 4, for the backhaul verification, during returning to zero when the standard equipment reaches the set standard value click [read data] button, then the data is recorded in the corresponding data column;

Step 6: When the verification is completed, click [Save];

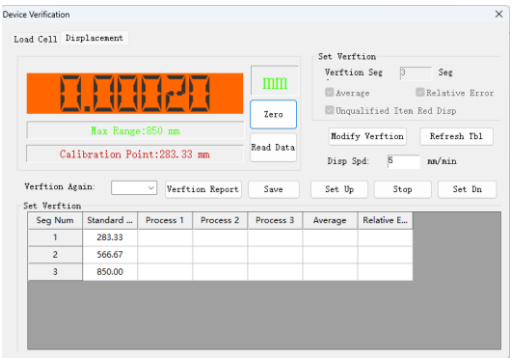
Step 7: After saving, click [verification report] to output the verification result report;

[Pre-load] -- The system traverses until the maximum range of the device according to the preset pre-load speed.

[Return zero] -- The motor will automatically return to the initial force zero position by setting the zero return speed in the parameter of lower machine.

[Re-verification] -- Re-verification specific item information

2 Displacement sensor verification



Verification method:

Step 1: Click [Modify] to set the verification items. Button will change to [Save \ Cancel]. When the

verification is completed, click the [Save \ Cancel]. If the list is not updated, then click the [Refresh];

Step 2: Set the standard value of each section to be verified;

Step 3: Set the displacement speed;

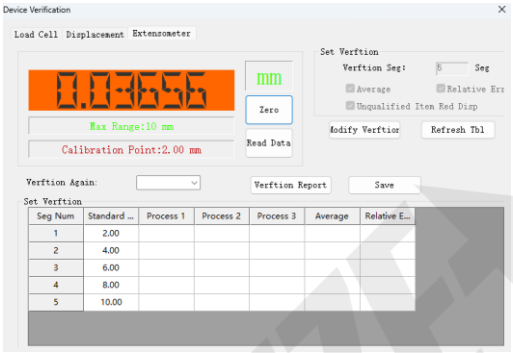
Step 4: Click [Clear] base on needs, then click [Up] or [Down] to start equipment verification. When the standard device reaches the set standard value, click [Read Data] button, then the data is recorded in the corresponding data column;

Step 5: After the verification is completed, click [Save];

Step 6: After saving, click [Report] to get the verification results report;

[Re-verification] – Re-verification specific item information

3 Extensometer



Verification method:

Step 1: Click [Modify] to set the verification items. Button will change to [Save \ Cancel]. When the verification is completed, click the [Save \ Cancel]. If the list is not updated, then click the [Refresh];

Step 2: Set the standard value of each section to be verified;

Step 3: Click [Clear] base on needs

Step 4: Start equipment verification, when the standard equipment to set the standard value, click [read data] button, then the data is recorded in the corresponding data column;

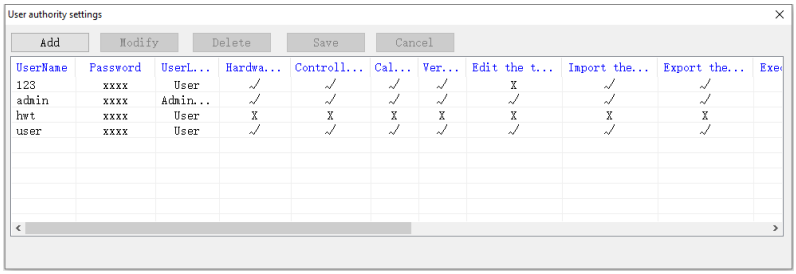
Step 5: After saving, click [Report] to get the verification results report;

Step 6: After saving, click [Report] to get the verification results report;

[Re-verification] ——Re-verification specific item information

10.3.3.3 User Management

Function: provide administrators rights to setting the other operators permissions



Only the administrator account can add the new administrator account or ordinary user account.

Setting method:

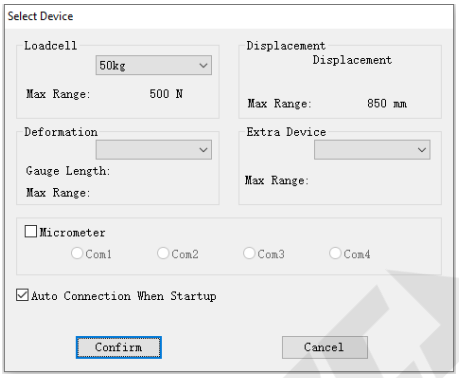
Click [Add], double-click the left mouse button to edit the user information and select the permissions, click [Save]. To change the user information, select the UserName, then click [Modify] to modify the user information and permission. Click [Save] to save the changes.

[Delete User] - Delete all information of the user selected.

10.3.4 Communication

Function: Make the equipment communicate with the computer

Click [Online] to select device



Online method:

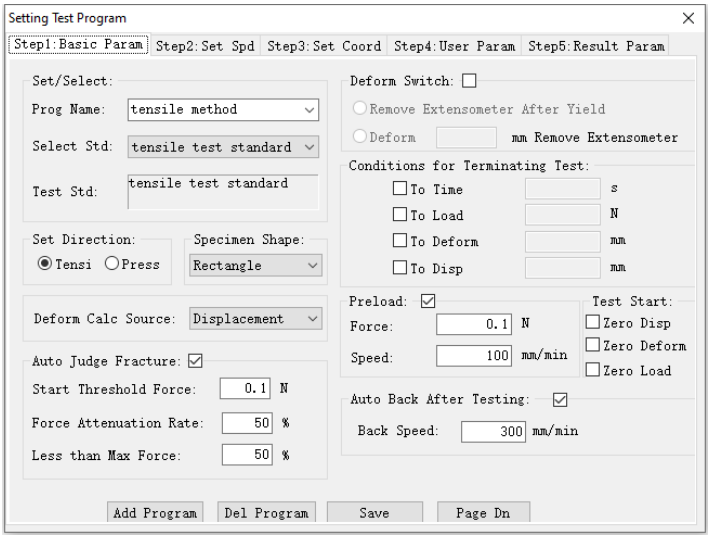
Select the sensor device used in this test and click [OK]. if check [Automatic Connection when Software Startup], the sensor selected by the previous time will be automatically connected each time the software is turned on. if check [Automatic Connection when Software Startup], software with previous selected sensor will be automatically communicate with equipment

10.3.5 Test preparation

10.3.5.1 Edit test method

Edit method:

Step 1: Edit the basic parameters



a. Click [Add method], input test method name.

b. Select related test standard code from standard list.

c. Select the direction of the test in direction setting.

d. Select the test specimen shape for software calculated cross-sectional area automatically. But about the special profile shape test software can't calculate the cross-sectional area automatically.

e. Select the data source for calculation of deformation. If equipment is not connecting deformation device should select "Displacement".

f. [Automatic judgment fracture] - In the process of test run according to the user's settings, automatic analysis of the specimen is broken, once judged to be broken, the test stops.

g. [Deformation switch] Select this item when using Extensometer. According to the test requirements, different deformation measurement methods are used in different test phases during the test. If user do not know whether the specimen has a clear yield and whether the yield is the maximum yield peak, then enter the deformation value to remove the extensometer.

If need to test the value of the strain hardening index n, input the value of the maximum deformation of the extensometer, when reach the maximum force in the test, click the  button. If the test need not extensometer, ignore the setting.

h. Setting conditions of end the test.

i. [Set time] - Stop the test when the test runs to the set time;

ii. [Set force] - Stop the test when the test runs to the set force;

iii. [Set deformation] - Stop the test when the test runs to the set deformation;

iv. [Set displacement] - Stop the test when the test runs to the set displacement.

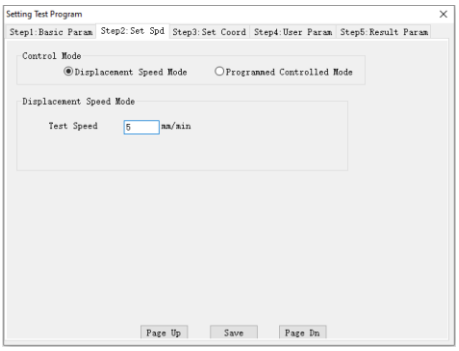
i. [Pre-load] When run to the specified pre-load force value then began to test, and began to record force value.

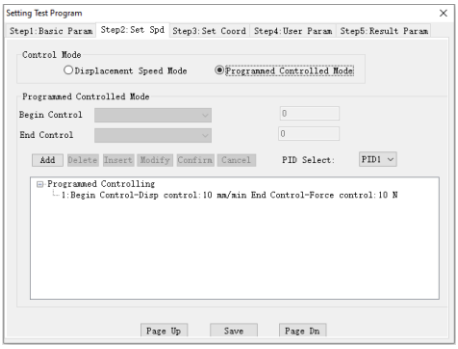
j. [Cleared when test start] When the running test starts, the value of displacement or deformation or force will be automatically cleared.

k. [Auto Return] Automatically return to the initial force zero point after the end of the test run. It can be set to return automatically according to the needs of the test. In general, it is not necessary to set auto return. The hard specimen is forbidden to set automatically return.

If set the automatic return, need to set the speed of automatic return according to actual needs.

Step 2: Setting speed, namely set the test control method and control speed.





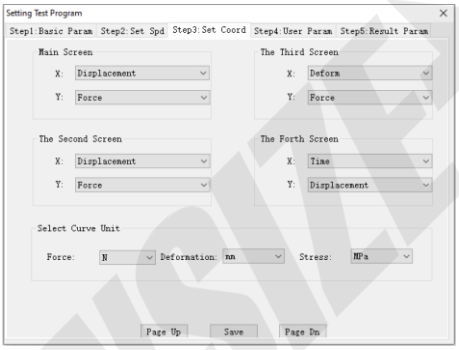
Setting method:

Select control mode according to test requirement:

If select displacement control, just input test speed;

If select program control, click [Add] to edit at least one control command and select the most suitable PID control parameter for the best closed-loop control effect.

Step 3: Coordinate settings, namely set the coordinates and units of the parameter.



Setting method:

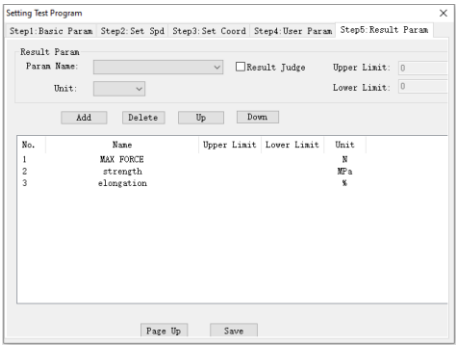
Setting the 3 group graph coordinates and units according to the test requirement; Among them, the main graph is the single display, and also the coordinate of the test report graph.

Step 4: User input parameter.

Setting method:

1. Select the parameter name and corresponding unit.
2. [Default value] User can set the default parameter value and can change in the experiment.
3. Click [Add], the parameters will be displayed in the list.
4. After adding parameters, click [Save].

Step 5: Test result parameter, namely select the result parameters of test requirements.



1. Select the parameter name and corresponding unit
2. [Default value] User can set the default parameter value and can change in the experiment;
   [Result Judgment] According to the set upper limit and lower limit automatically judge the result is ok or not.
3. Click [Add], the parameters will be displayed in the list;
4. After adding parameters, click [Save].

10.3.5.2 Explanation of test terminology

1 Basic parameters

Test method name: Test method name is the only identification of a test method, according to the different requirements of different tests to name, such as metal tensile test, test use extensometer, the specimen is a metal rod, you can name the test method "Metal tensile _ Extensometer_ rod " to show the difference between the deformation measured with the displacement and other sample shapes.

Test direction: that is the direction of loading, pull test choose pull direction and pressure test choose pressure direction.

Deformation calculation options: According to the test requirements to select displacement, deformation, expansion of device.

Specimen profile shape: There are five kinds of shapes to choose: ① rod, specimen size input diameter; ② plate, specimen size input width and thickness; ③ pipe, specimen size input diameter and pipe thickness; ④ arc, specimen size input Width, wall thickness, outer diameter, sample interception direction ⑤ special profile shape, specimen size input the cross-sectional area;.

Auto return: jig or crossbeam return to the test beginning position automatically after the test finish.

Pre-load force: It is the test force which test force to reach this setting force, the software began to save the sampled data, that is, to this moment, the sampling data is valid. The purpose of this is to eliminate the jigs, specimen and other connections gap, generally can be set to the recommended value is the current force sensor full scale 5/10000. When reach pre-load force, the deformation sensor display value will be cleared automatically.

Set force (unit: N): During the test, When the force reaches the set force, then the test end automatically. For example, if user expect the test force reach 1000N, stop the test, user can input value 1000 in this frame. This stop condition can also effectively protect the force sensor. For example, the full scale of the equipment existing force sensor is 10000N. If user input value 10000, the test will be stopped automatically when the test force reach to 10000N. So the force sensor can be protected.

Set deformation: This is also a test auto stop condition, where the deformation is measured by the extensometer. When deformation value reach to setting value, the test will be stopped automatically. Setting this also protects the extensometer and similar force sensor. This stop condition is only useful when the

deformation measured by the extensometer. Generally, this uncommonly used.

Set displacement: This is also a test stop condition, which means that when the displacement measurement deformation reaches this positioning shift, the test will automatically stop. The user can refer to the usage of the force to use this stop condition.

2 Control method

Displacement control: Test from start to end, the crossbeam moves at a certain speed, and only need to set a speed parameter.

Program control: program can set multiple control steps; test will be carried out by setting multiple control steps.

a) Run control mode: it is control method for each step of the test. Software preset a variety of control methods: displacement control, force control, deformation control, extensometer strain control, stress control, displacement strain control, displacement holding, force holding, the beginning of the cycle, the end of the cycle, the sampling interval, The displacement holding or force holding control reach the holding time (unit is s) and switch to the next step automatically. If user choose [sampling interval], then the sampling points during testing are not all saved, the software according to the interval save some of the sampling points.

b) Test speed: It is a test step run speed. Different control methods, the speed units are different. For example, if choose the displacement control then the speed unit is mm / min. if choose the force control then the speed unit is N / s.

c) End the step control mode: namely ending this step test method, depending on the endpoint value to control. Software preset a variety of control methods, displacement control, force control, deformation control, stress control, displacement strain control, extensometer strain control.

End value: It is this test step to reach this set value to end this step test, switch to the next step. The unit of the end point is also related to the end control mode.

An example of how to edit a control program:

Step 1: Click [Add] button;

Step 2: Choose [Displacement] in [Run control mode] drop-down list;

Step 3: Input speed value 10;

Step 4: In the [End the step control mode] drop-down list also chooses the "displacement control";

Step 5: Input displacement value 10;

Step 6: Click the OK button, this step of the test can be added to the step list

Repeat the above steps to add more test steps.

If add an error test step s in the step list, user can select the step and click the [modify]button to modify the step. If a step is not needed, select the test step and click the [delete] button to delete the test step. If do cycle test, select [Start of cycle], fill in the cycle times, and click the [Save] button to save all the settings.

10.3.6 Import test method

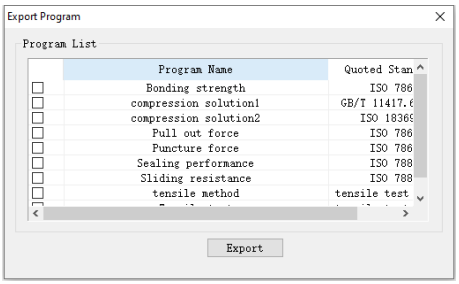
Function: Import edited test method

Import method:

Select the method which needed to import, click [OK], then according to the guide do it.

10.3.7 Export test method

Function: Backup the method

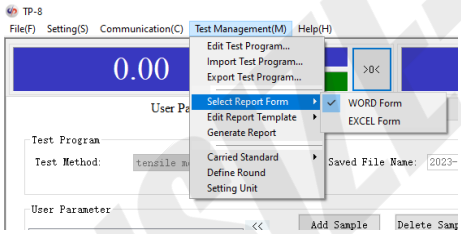


Export method:

Select the method which needed to export, click [OK], then according to the guide do it.

10.3.8 Select report format

According to test demand select the test format of Microsoft Word and Excel.



10.3.9 Edit report format

10.3.9.1 Edit word format of test report

Edit method:

1 Click [New], input format name, report title, select the associated test method.

2 According to test needs check the statistical options.

3 According to the test report requirements, select the number of columns.

4 According to the test report requirements, select the parameters, click [Add].

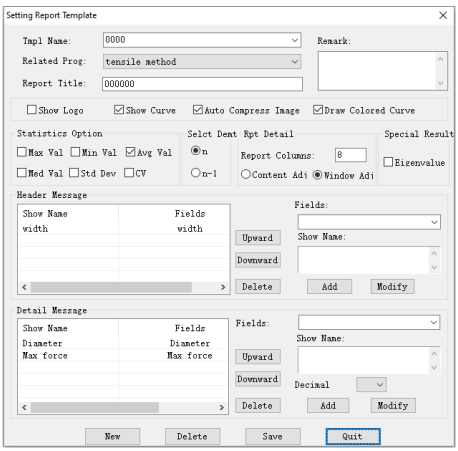
5 After finish editing, click [Save] and [exit]. When the test is finished, the edited test report template can be selected and can create the report.

Description:

[Report Statistics]

※ [Auto Compression] - The software will automatically compresses the image to fit the page size.

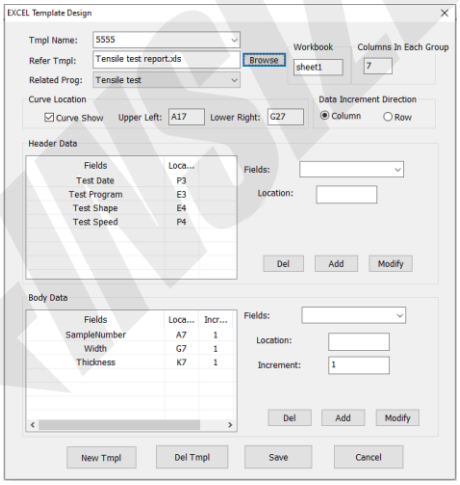
※ [Report Detail Specification Setting] – If select [Content Adjustment], the size of the table will fit the size of the data. If select [Window Adjustment], the page width will be split by the numbers of data.



10.3.9.2 Edit excel format of test report

Edit method:

1 Click [New], input format name, select the reference template, click "Browse" in the Report folder, select the format you want to reference. If you do not have a ready-made template, manually create the required Excel test report template in the Report folder. The user parameters required in the report template can be manually edited in this time, or added in the Excel template editing window in the software.

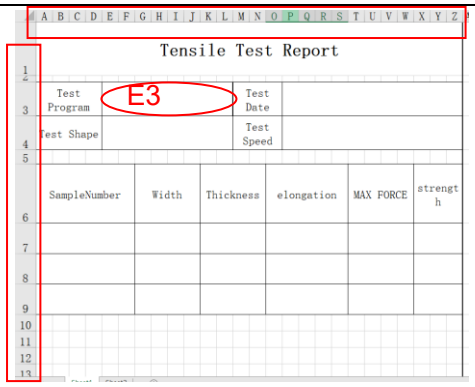


2 In the associated field, select the parameters need to be reflected in the report, enter the corresponding position in the Excel table, click [Add] to according to the test report requirements, select the parameters, input the parameters position of excel, then click [Add].

3 Finish editing, click [Save]and[Exit].After the test, the edited test report template can be selected when creating the report.

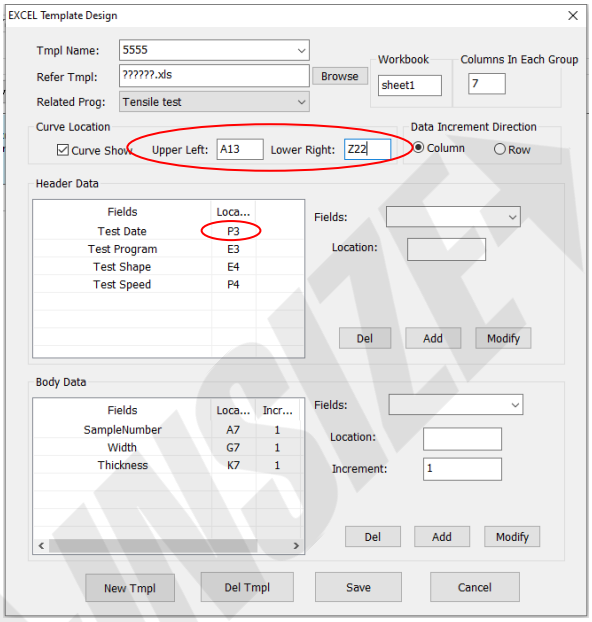
For example:

Create a new metal Room temperature tensile test report template, put the template into the Depex \ Report folder.

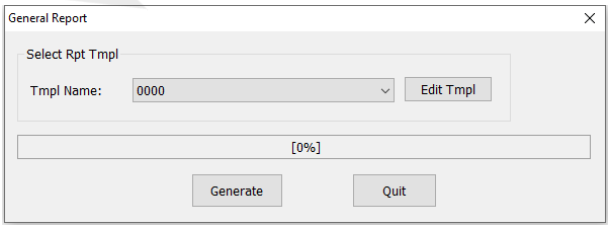


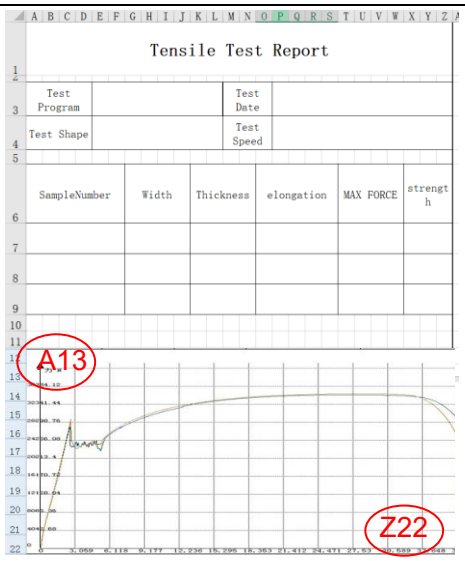
Metal plate at Room temperature tensile report template

If the test date in the template is filled in the E3 form (if multiple combined forms, fill in the first form position, here is E3).



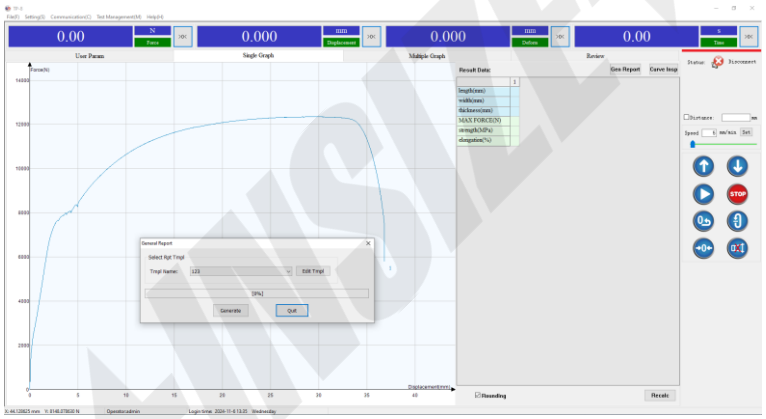
After editing the report template, click "Save modify" and then click "Exit." Re-enter the single graph, click "Generate Report", select the edited template, click "Generate" to generate Excel format report.





10.3.10 Generate a report

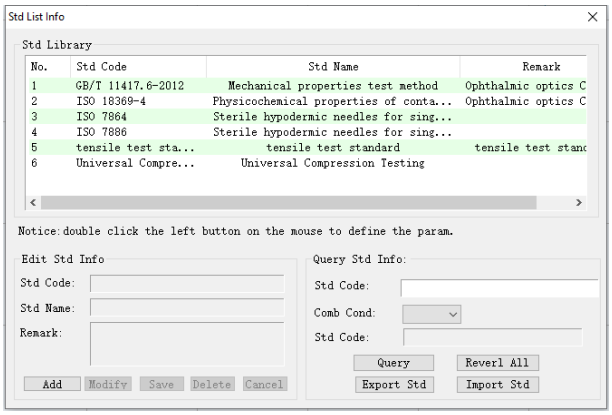
Click [Generate Report], then click [Generate] to generate a report. Click this pop-up window [Edit Template] button, you can also enter the test report template editing.



10.3.11 Edit test standards

10.3.11.1 Test standards list

Function: Edit the standard information on which the test was based



Edit method:

[Add] - Click [Add] button, input new standard information in [Standard information edit] area, click [Save]

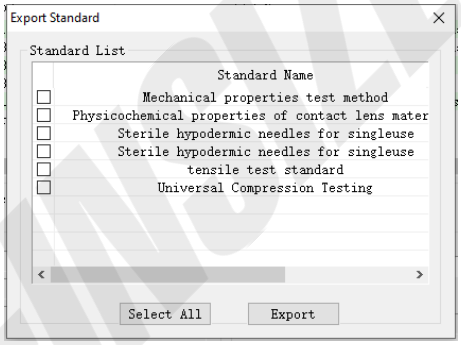
[Modify] - Select the standard in standard list, click the [Modify] button, and input the modified information, click [Save].

[Delete] – Click [Delete]will delete all the information of the selected standard. Be careful!

[Query] - Enter the query information and click [Query], then the standard items that meet the information will be displayed in [Standard Library]

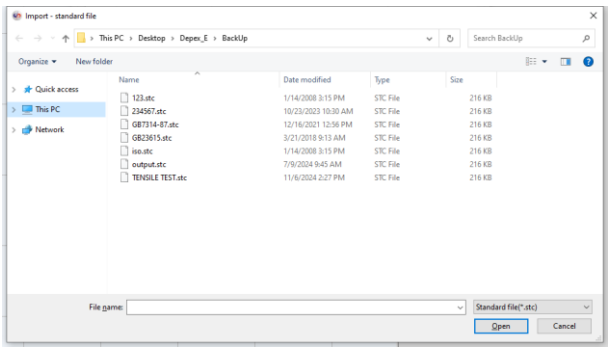
[Export Standard] - Select the standard in [Standard List] and click [Export], you can export the standard according to the guide.

(Note: The standard export default path to \ BackUp \ folder)



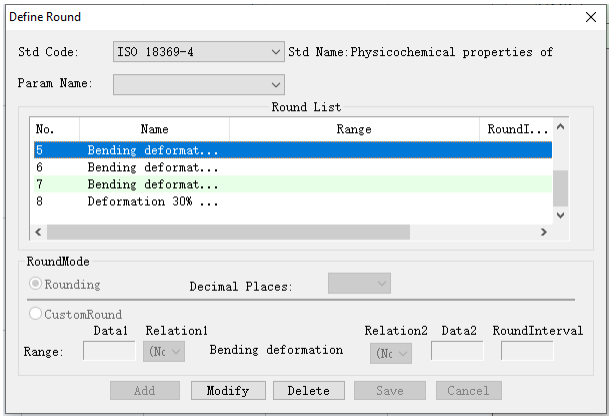
[Import Standard] Select and import the standard into the standard library, according to the guide;

(Note: The standard to be imported must be copy to the \ BackUp \ folder)



10.3.11.2 Define parameters

Function: Define test standard parameters for editing the test method



Method:

[Add Parameters] - Select Standard No. from standard list, click [Add Parameter], input parameter information in [Parameter Edit] area, click [Save] to add parameters for this standard;

[Add Formula] - Select the standard code in [Standard Information] area and select parameters in [Parameter List]. [Add Formula] button becomes available, click [Add Formula], input the formula information click [Save] to add the formula for the parameter. User parameters only allow one formula.

[modify]

(1) Modify the parameter information: Select the parameter from parameter list, click [Modify] to enter the information of the parameter modification status, and click [Save] to finish.

(2) Modify parameter formula information: Select the parameter from parameter list, then click [Formula list] item, then click [Modify] to enter the parameter formula information modification status. Click [Save] to finish.

[delete]

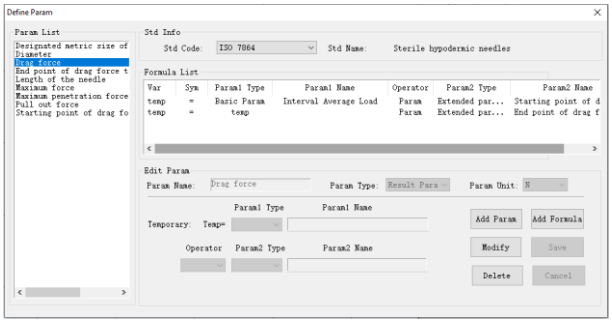
(1) Delete the parameter information: Select the parameter from parameter list, click [Delete] to delete all the information related to this parameter;

(2) Delete the parameter formula information: Select the parameter from parameter list, then select the item to be deleted in the formula list, and then click [Delete] to delete a formula of this parameter.

Description:

The standard parameters are divided into two kinds: user parameters and result parameters. User parameters are generally required user input data before the test. Such as specimen diameter, specimen gauge, extensometer gauge, specimen width, specimen thickness and more. The resulting parameters are generally calculated by the software according to the acquisition original data after the test is finished. Such as elastic modulus, maximum force, tensile strength, yield strength, etc.

a) Formula expression description;



The first and second columns of the formula default to "temporary variable" and "=". The three and six columns are "parameter type 1" and "parameter type 2", there are generally four types, namely: basic parameters, extended parameters, constants and temp.

Specific description is as follows:

i. Basic Parameters: the smallest unit for calculation;

ii. Extended parameters: edited parameters for the second calculation;

iii. Constant: The parameter is a constant, directly equal to a certain value, such as π = 3.1415926;

iv. temp: Intermediate variables for editing formulas.

In the formula area, the fifth column is a "symbol". Generally, there are eight symbols of +, -, ×, /, param, sqrt, ln, sin and cos. Parameters can be calculated by +, -, ×, /, square root, natural logarithm, sine, cosine and other symbol. Param Symbol meaning: Parameter 2 is the parameter of parameter 1, such as parameter 1 type is the basic parameter, the parameter 1 name is the non-proportional elongation, the symbol param, the parameter 2 name is 0.2, Mean the result of non-proportional at elongation of 0.2%. the fourth and seventh column are "Parameter Name 1" and "Parameter Name 2", these two columns can enter or choose what is determined by the type of parameters. If the parameter type is selected, such as basic parameter or extended parameter, then the next parameter name is the drop-down box, user can select the correct name; if the parameter type is selected such as constant, then the parameter name can only enter some values, Constants generally appear in the parameter type 2; If the parameter type is selected such as temp, then the name of the parameter is fixed, user cannot change, temp generally appears in the parameter type 1.

Special parameters description:

1. Calculate [maximum force between two points], [minimum force between two points], [average force between two points]

2. In the formula, the [Parameter Name 2] is a custom input user parameter or an unknown variable. The [Parameter Name 2] indicates the start point and end point between two points. As shown below

Formula List

Var	Sym	Param1 Type	Param1 Name	Operator	Param2 Type	Param2 Name
temp	=	Basic Param	Interval Average Load	Param	Extended par...	Starting point of d
temp	=	temp		Param	Extended par...	End point of drag f

3. Calculate [tearing force], [peel force]. The result parameters need to associate three parameters, the meaning of the three parameters are starting coordinates, interval length, the number of intervals

10.3.12 Definition rounding

Function: Define the number of digits after the decimal point. Generally used rounding five parity method to revise the value.

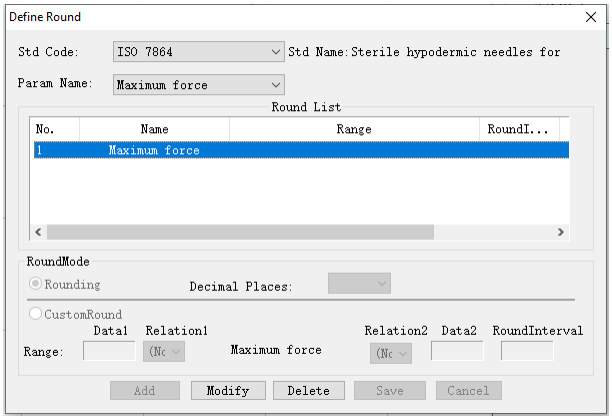
Rounding five parities: the last digit is 5, if the previous digit is an odd then the previous digit increases 1 and become an even, if the previous digit is an even then discard the last digit

Such as 4.56 become 4.6, the last decimal greater than or equal to 6 forward one.4.54 become 4.5, the last decimals are less than or equal to 4, discard it. So, 4.45 become 4.4, 4.55 become 4.6.

Rounding method:

1. Select the standard code, and then select the parameter name, click the parameter in parameter list, click parameters. At this time [modify] button becomes available button.

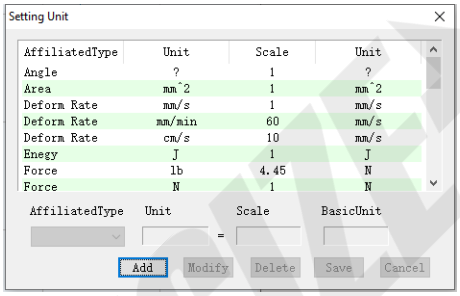
2. Click [modify], select a rounding method, the general method is rounding five parities, set the number of decimals, and then click [save].



10.3.13 Unit setting

Function: Set the parameters unit

Method: Click [Add], select the type, enter the unit symbol and coefficient, click [save].



11 Examples of test methods

11.1 Test steps

1) Open the DEPEX test software and select the name of the sensor to be used (refer to chapter 3.3.2). Then click the [OK] button to connect to the host;
2) Select an existing, suitable test method, if not, you need to create a test method, set the relevant test parameters (select the test speed, test direction, specimen shape, set the default parameters of the specimen etc.) (refer to chapter 3.3.8)
3) Enter the file name of the test data, if there is no input, the software has the default save file name;
4) Enter the specimen size and other user parameters in the "User Parameters" interface of the software;
5) According to the specimen size, adjust the position of the crossbeam by hand controller, install the jig, fix the limit switch, then adjust the crossbeam to the proper position, then clear the displacement in the software and set the current position of the crossbeam as zero point (If you need to return automatically, it is necessary to clear displacement display value before the test running), the force sensor to clear;
6) Clamp the specimen, clamp extensometer or large deformation device (if the test need to use extensometer or large deformation device);
7) After confirming that the test parameters are correct, press the operation button on the hand controller or software to start the test;
8) Deformation of the specimen to reach the extensometer switch value, remove the extensometer; (if the test use extensometer)
9) When the test is finish, remove the specimen;
10) If you continue the experiment, repeat 5 to 9 steps;
11) Generate test report (refer to chapter 3.3.10)
12) Finish the test, must be off-line, exit the software and turn off the computer;
13) Turn off the test equipment power.

12 Basic parameter description

12.1 The basic parameters of need to input value

1) Custom Input: user-defined input value or description.
2) Extensometer gauge: Namely extensometer gauge of specimen. when strain calculated by deformation or expansion device instead of displacement, then need to set the extensometer gauge used to calculate the strain
3) Original gauge length: Namely the original gauge length of the specimen. when strain calculated by displacement or dial gauge instead of deformation, then need to set the original gauge used to calculate the strain.
4) Width: The width of the plate or arc specimen, used to calculate the specimen cross-sectional area.
5) Length: the length of the specimen.
6) Thickness: The thickness of the plate sample, used to calculate the specimen cross-sectional area; If the test is a bending test, and used to calculate the strain.
7) Diameter: The diameter of the rod specimen, used to calculate the specimen cross-sectional area; If the test is a bending test, and used to calculate the strain.
8) Outer diameter: the outer diameter of the pipe specimen or the arc specimen, used to calculate the area.
9) Wall thickness: The wall thickness of the pipe specimen or the arc specimen, used to calculate the area.
10) Specimen intercept direction: The intercept direction of the arc specimen, used to calculate the area. Specimen Intercept Direction input the value: 0 for horizontal; 1 for speed.
11) Minimum diameter: the minimum axial diameter of the specimen.
12) Area: as a user parameter, can be input the cross-sectional area value directly, the result parameters calculate by the area directly (mainly for special shape specimens); as a result parameter, the value of the area calculate by the software according to the shape of the specimen and related parameters automatically.
13) Arm of force: Arm of force is the distance of two heads for 4-point bending test, used to calculate the area.
14) peel tear parameters: used to calculate the peel force and tearing force, the format is: starting coordinates, interval length, the number of intervals.
15) Offset gage length: Used to receive the static longitudinal gage value given by the video extensometer.
16) Breaking Diameter: The diameter (gauge length) value used to receive the video extensometer.
17) Span: the distance between the fulcrum, for three-point bending angle control.

12.2 Basic parameters for calculation

1) Yield point: when the upper yield point and lower yield point are invalid, the stipulated non-proportional strain instead of the force value, the general use of $Fp_{0.2}$ instead.
2) Upper yield force: the force corresponding to the yield point in a curve (if the curve has no apparent yielding stage, then the upper yield force is 0).
3) Lower yield force: the force corresponding to the yield point in a curve (if the curve has no apparent yielding stage, then the Lower yield force is 0).
4) Maximum force: the maximum force of a test curve or a section curve by program control.
5) The deformation at the maximum force: the deformation corresponding to the maximum force in a curve or a section curve by program control.

6) Maximum force between two points: the maximum force between two deformation points, be related two parameters.

7) Minimum force between two points: the minimum force between two deformation points, be related two parameters

8) Minimum force: the minimum force of a test curve or a section curve by program control.

9) The deformation at the minimum force: the deformation corresponding to the minimum force in a curve or a section curve by program control.

10) Maximum deformation: the maximum deformation in a test curve or the maximum deformation of the curve of the specified control section can be obtained by program control.

11) Minimum deformation: the minimum deformation in a test curve or the minimum deformation in the specified control section curve can be obtained by the program control.

12) Maximum deformation force: the maximum deformation of a test curve corresponding to the force value or the maximum deformation in program control section of the curve corresponding to force value.

13) Minimum deformation force: the minimum deformation of a test curve corresponding to the force value or the minimum deformation in program control section of the curve corresponding to force value.

14) Maximum displacement: the maximum displacement in a test displacement curve or the maximum displacement in program control section of the curve

15) Force at Maximum Displacement: the force value corresponding to the maximum displacement in a test displacement curve or the force value in program control section of the curve corresponding to the maximum displacement

16) The time at the maximum displacement: the time value corresponding to the maximum displacement of a test displacement curve or the time value in program control section of the curve corresponding to the maximum displacement

17) Average Force Between Two Points: the average force between two deformation points, be related two parameters.

18) Area Between Two Points: the area covered by the test curve between two deformation points, be related two parameters.

19) The force at stipulated non-proportional elongation: the force at stipulated non-proportional elongation is equal to the force at stipulated percentage of the gauge length. When the deformation calculation is based on the displacement or dial indicator, the gauge length is the original gauge length; when the deformation calculation is based on the deformation or extension device, the gauge length is the extensometer gauge length.

20) The force at stipulated non-proportional elongation--gradual close in method: according to GB / T228.1-2010 use the close in method to calculate the force at stipulated non-proportional elongation. Note: There are obvious elastic section and the elastic height of less than 0.5Fm, then does not use close in method.

22) The force at stipulated non-proportional elongation--hysteresis loop method: the use method refers to item19); Note: Only suitable for the curve no obvious elastic section.

23) The force at stipulated total extension: the force at total elongation equal to the force at the percentage of the gauge. When the deformation calculation is based on the displacement or dial indicator, the gauge length is the original gauge length; when the deformation calculation is based on the deformation or extension device, the gauge length is the extensometer gauge length.

24) The compression force at stipulated non-proportional elongation: is equal to the compression force at the stipulated value.

25) The compression force at stipulated non-proportional elongation--gradual close in method: the use method refers to item19); Note: There are obvious elastic section and the elastic height of less than

0.5Fm, then does not use close in method.

26) The compression force at stipulated non-proportional elongation--hysteresis loop method: the use method refers to item19); Note: Only suitable for the curve no obvious elastic section.

27) Stipulated total compressive force: the total compressive force is equal to the force at the stipulated compressive strain.

28) Elastic Coefficient: the ratio of the force difference to deformation difference, the difference calculates from the elastic start point to the elastic end point.

29) Modulus of Elasticity: the ratio of stress difference to strain difference between the elastic starting point and the elastic ending point. It is used for the pull test and the compression test. The software automatically calculates the optimal result by linear regression method.

30) Peeling force: the average force calculated by some force values collected at a certain sampling interval after a starting point of deformation.

31) Tearing force: the average force calculated by some force values collected at a certain sampling interval after a starting point of deformation.

32) Breaking force: the force of the specimen at the time of fracture in the test.

33) strand breaking force: this basic parameter is specialized for strand breaking force test.

34) Energy: the area covered by a test curve.

35) Stress at definite deformation: the first stress value corresponding to the definite deformation; If the test control by program control, the stress at definite deformation is corresponding to setting deformation value in program control.

36) Force at definite deformation: the first force value corresponding to the definite deformation; If the test control by program control, the force at definite deformation is corresponding to setting deformation value in program control.

37) Strain at definite force: the first strain value corresponding to the definite force. If the test control by program control, the strain at definite force is corresponding to setting force value in program control.

38) Stress at definite strain: the first stress value corresponding to the definite strain; If the test control by program control, the stress at definite strain is corresponding to setting strain value in program control.

39) Strain at definite stress: the first strain value corresponding to the definite stress. If the test control by program control, the strain at definite force is corresponding to setting stress value in program control.

40) Deformation at definite force: the first deformation value corresponding to the definite force; If the test control by program control, the deformation at definite force is corresponding to setting force value in program control.

41) Deformation at definite stress: the first deformation value corresponding to the definite stress; If the test control by program control, the deformation at definite stress is corresponding to setting stress value in program control.

42) Force at definite strain: the first force value corresponding to the definite strain; If the test control by program control, the force at definite strain is corresponding to setting strain value in program control.

43) The energy at maximum force: the energy at maximum force is equal to the area value covered from the test curve beginning to the test curve maximum force.

44) Strain Hardening Index n value: Strain Hardening Index n value corresponding to specified deformation interval required by special standards.

45) Poisson's ratio U value: for obtaining the ratio of transverse strain to axial strain on the elastic section. Note: the extension device must be extensometer to measure the transverse deformation.

46) Bias yield force: the force at the stipulated of non-proportional strain.

47) Plastic strain ratio r: the ratio of the true plastic strain in the width direction to the true plastic strain in the longitudinal direction by uniaxial tensile stress, which is only suitable for the uniform plastic strain range.

48) Condition Value Fq: namely Fq value at KIC test.

49) Deformation atr upper Yield Force: the deformation value at the upper yield point.

50) Deformation atr lower Yield Force: the deformation value at the lower yield point.

51) Deformation zero point: the deformation value of the intersection of elastic straight line and X axis.

52) Stiffness zero point: the deformation value of intersection of rigid line and X axis.

53) Elastic Starting Force: the force value at elastic starting point in the elastic linear section.

54) Elastic end force: the force value at elastic end point in the elastic linear section.

55) Deformation of elastic starting point: the deformation value at elastic starting point in the elastic linear section.

56) Deformation of elastic end point: the deformation value at elastic end point in the elastic linear section.

57) The force difference at elastic section: the force difference between the elastic end point and the elastic start point.

58) The deformation difference at elastic section: the deformation difference between the elastic end point and the elastic start point.

59) Secant modulus: the ratio of stress to strain at a point on a stress-strain curve, which is the slope of the line connecting the origin of coordinates to the point, as defined by the user with strain values.

60) Chord modulus: the ratio of stress difference to strain difference between two defined points on the stress-strain curve, the two points defined by the user with two deformation values.

61) Tangent Modulus: the slope of the tangent at a point on the stress-strain curve, the point is selected by the user with a deformation value.

62) Average peel force: the average force between two points of deformation. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

63) Average tearing force: the average force between two points of deformation. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

64) Maximum Peak: the maximum of all peaks between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

65) Minimum Peak: the minimum of all peaks between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

66) The average value of peak: get the average of all the peaks between the two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

67) Maximum trough value: the maximum of all troughs between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

68) Minimum trough value: the minimum value of all troughs between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

69) The average value of trough: the average of all troughs between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

70) n peak force value: the nth large peak force value of all the peaks between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

71) n trough force value: the nth large peak force value of all the troughs between two deformation points, If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

72) n peak deformation: the deformation value corresponding to the nth largest peak of the force in all the

peaks between the two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

73) n Trough deformation: the deformation value corresponding to the nth largest trough of the force in all the troughs between the two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

74) The peak median: the median of all the force peaks between two deformation points. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

75) Peak Median with Straight Line Method: the median of the peak force between two deformation points is obtained by the straight-line method. If the two points are not defined, they will be automatically defined from the 1/3 to 2/3 range of the maximum deformation.

76) The deformation at setting area: the deformation value is corresponding to the specified area under test curve;

77) The deformation at setting energy: the deformation value is corresponding to the specified energy under test curve;

78) The force at setting area: the force value is corresponding to the specified area under test curve;

79) The force at setting energy: the force value is corresponding to the specified energy under test curve;

80) The energy at setting force: the energy value on the curve corresponding to the setting force;

81) The area at setting force: the area value under the curve corresponding to the setting force;

82) The Energy at setting deformation: the energy value on the curve corresponding to the setting deformation;

83) The area at setting deformation: the area value on the curve corresponding to the setting deformation;

84) Energy between two points: the energy between two points is equal to the area between two deformation points on the curve;

85) The force at setting time: the force value at the specified time.

86)The force at setting time: the deformation value at the specified time.

87) Sum Σ: the sum calculated parameter data of all the samples displayed in the current result.

88) The number of specimens n: the current results show the total number of all the samples.

89) Test time: the last time value on the curve;

90) Start Time: the time when the test start;

12.3 The instructions of the basic parameters with Param calculating signs

1) Yield point force, bias yield force: if [Parameter type 2] is constant, [Parameter name 2] directly input the stipulated proportion, such as 0.2; If [Parameter type 2] is extended parameter, [Parameter name 2] is a user parameter which are related with basic parameters [custom input].

2) The maximum force between two points, the minimum force between two points, the average force between two points, the area between two points:

If [Parameter type 2] is constant, [Parameter name 2] directly input a parameter between two points; If [Parameter type 2] is extended parameter, the extended parameter is the initial deformation and the final deformation.

3) The stipulated non-proportional elongation, the stipulated total extension of the force, the stipulated non-proportional compression force, the stipulated total compression force: If [Parameter Type 2] is constant, [Parameter Name 2] directly enter the specified ratio, such as 0.2; If [Parameter type 2] is

extended parameter, [Parameter name 2] is a user parameter which are related with basic parameters [custom input].

4) Peel force and tearing force: When [parameter type 2] is constant, the format of [parameter name 2] is: start coordinate, interval length and interval number. When [parameter type 2] is extended parameter, [Parameter name 2]is a user parameter whose basic parameter is [Peel tear parameter].
5) Poisson's ratio U value: If [Parameter type 2] is constant, [Parameter name 2] directly input the horizontal extensometer gauge value, usually the diameter or width value; [Parameter type 2] is the extended parameter, [Parameter Name 2] is a user parameter whose basic parameter is [custom input], inputting the horizontal extensometer gauge value each time by the user.
6) Plastic strain ratio r value: [Parameter type 2] is constant, [Parameter name 2] is directly input to the deformation value by single point method, or directly input a deformed two-point parameter as the solution deformation range; [Parameter Type 2] To expand the parameter, [Parameter Name 2] is a user parameter whose basic parameter is [User-defined Input], input the deformation value each time by the user, or [Parameter Name 2] is a basic parameter For the user parameters of [parameter between two points], each time the user inputs the solution deformation range.
7) Maximum peak value, minimum peak value, peak average value, maximum trough value, minimum trough value, trough average value, peak median value and median crest value Method: [Parameter Type 2] is constant, [Parameter Name 2] Directly input a parameter between two points; [Parameter Type 2] is an extended parameter, the format of [Parameter Name 2] is the initial deformation and the final deformation.
8) n peak force, n trough force, n peak deformation, n trough deformation: [Parameter Type 2] is constant, [Parameter Name 2] directly input a parameter between two points; [Parameter Type 2] is extension parameter, The format of [Parameter Name 2] is the initial deformation, the final deformation, N, where N represents the order from big to small.
9) Maximum force: [Parameter type 2] is constant, the input format is N, among which N is the control segment of program control; [Parameter type 2] is the extended parameter, [Parameter name 2] is a parameter whose basic parameter is [User-defined input] user parameters, each input by the user control section.

13 End Message

DEPEX software will be optimized continuously, we welcome all users for our reasonable advice to make our products more perfect, to provide you with better product.

We look forward to your suggestion and advice, thank you for your use!