BGD 573

Computer Servo Tensile Machine

(Single Column)

INSTRUCTION MANUAL

Biuged

BIUGED LABORATORY INSTRUMENTS （GUANGZHOU） CO.,LTD

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ABOUT US

Biuged Laboratory Instruments（Guangzhou）Co. Ltd. is one of leading professional manufacturers of instruments used in the paint, ink and coatings industry in China.

Originally formed in 1963, we have grown to an internationally recognized business with a worldwide customer base which includes the worlds leading paint and coatings manufactures and users. Till now, we have established more than 50 agents or offices in all over the world. We have a team of dedication, high level education, cooperation and strong creativity. Our instruments are of both high quality and high ratio of performance to price so that products are salable to world- wide market.

Our RR&D department continually investigates new product design ideas, in conjunction with the major standards committees, in order to supply up to date instrumentation for the Quality Control of coatings. We always apply the advanced contemporary techniques and experience to our new products.

Our manufacturing department ensures that all our products are built to the highest quality, every instrument undergoing rigorous calibration and testing before it leaves our factory. We also can supply the third side calibration certificate when customer need.

Our service department, which has expanded to meet the increasing demand for maintenance and calibration both in-house and in the field, offers a full range of services

'Quality first and user uppermost' are one of our claims. Our Instruments strive for best in quality and after-sale service. Satisfying your needs are our wishes.

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1、Overview:

This model pull presses, the company is well-designed, with strict quality management of manufacturing quality products. Versatile, and can be implemented tension, compression test. Test a variety of materials such as: plastic products (cloth, pipe, plate) rubber (plate, tube), tape, tire industry, textile, acrylic, FRP, EVA, PE and footwear finished or semi-finished products of the dumbbell-shaped specimen to test its tensile strength, elongation, tear, peel, glue focus on a number of function

2. Machine specifications

1 capacity options: 10kg-500kg precision sensors
2 units switch: Kg, N, KN,
3, Load measurement accuracy: ± 0.3% (full scale 0.4% -100%)
4 Resolution: 1/250000
5 biggest test space (excluding fixtures): About 1100mm
6, test speed :0.001-500mm / min stepless speed
7, data sampling frequency: 200times/sec
8, can store the results of numerous tests reference point automatically calculate the average, automatically grab the maximum fracture strength value.
9 breakpoint ratio setting range: 0 to 99% can be set according to the different test specimen need to achieve the status of the different positions of downtime.
10, safety devices: overload, emergency stop device, the upper and lower travel limit devices.
11, the power system: servo motor
12, Power: 400W
13, Volume: 600×410×1250mm
14, Weight: 75kg
15, electrically source: 1Φ, 220V, 15A

3、Third, the method of operation of the testing machine .

1, the first level of the testing machine for adjustment of the horizontal instructions to adjust the basis of the screws by Level (installed machine or mobile machine adjustment).

2, open the computer, start testing machine main power switch, mounting fixture, and adjust the tension machine software parameters in the computer.

3, the correct device specimen jig selection must be appropriate, after optional jig in accordance with the kind of the material of the test sample, the test strip first folder in the upper jig, start the motor under the associated board clamp lift to the appropriate folder location sandwiched trial piece, specimen holder can not be subject to tension or compression, so as not to affect the test results. If you want to install large deformation, large deformation of the upper and lower slider (the distance between the two clamps default is 25mm), then grip the middle part of the sample,

4, before the test, adjusting the lower stroke setting the lower limit position of the ring to the desired range, so that the lower jig to this bit range after touches limit switch downtime.

5 to zero, all display subtitles, ready to take the test.

6, start the motor so linked board dropped to start the test, is starting to show specimen tensile value, until the specimen fracture load of maintaining minimum, record values , remove the fracture specimens, according to the above method of clamping trial The pieces display value to zero to re-test, if the test has been completed, please turn off the power.

4、Note and maintenance .

4.1 Note:

4.1.1 The machine displays the power of the motor in accordance with label input.
The 4.1.2 operating personnel must be familiar with the operation and maintenance of the machine, and pay attention to the use.
4.1.3. LOAD CELL sensor pull pressure dual-use, do not exceed the permissible load test, in order to avoid damage.
4.1.4 The machine control and display system for precision electronic components, power should be as independent as possible and to prevent foreign interference.
4.1.5 Place the environment must be kept clean, and do not wet.
4.1.6. Need to migrate, Please note that the handling, not to damage parts.
4.1.7. Replacement fixture should be noted that the pick-and-place, in order to avoid falling bruised parts.
4.1.8 regularly review the drive belt is loose, and adjustments.
4.1.9. Regularly application inspection and correction, to ensure accuracy.

4.2 The maintenance matters:

The 4.2.1. Machine parts, always wipe appearance kept clean.

4.2.2. Plating part to oil wipe to prevent rust should ensure bright.

4.2.3 power screw and screw parts, please add lubricating oil, in order to maintain the transmission of sensitive. (Lubricants using butter, add a little oil can be mixed).

4.2.4 panel (control box display) with a dry cloth, and strictly prevent the water on, in order to avoid damage to the IC electronic components.

4.2.5 of the fixture and fittings properly set, and remove anti-rust oil to prevent rusting.

4.2.6. Gearbox should regularly every year to view whether the oil spill, and replace the gear oil.

5、Formula

1、.Section area of dumbbell shape test piece＝thickness（ ㎝ ）×width of parallel part（ ㎝ ）

2、.Tensile strength T_B（ Kg / cm^2）＝ $\dfrac{\text{Break load}\,(kg)\,F_B}{\text{Section area of test piece}\,(cm^2)\,A}$

3、. Elongation ratioE_B（％）＝

$$\frac{\text{Distance between } L_1\text{-Original distance between coordinate points} L_0}{\text{Original distance between coordinate points} L_0} \times 100\%$$

4、

Adhesive strength T_F（ Kg / c ㎡ ）＝ $\dfrac{\text{Peeling load}\,(kg)\,F_F}{\text{Width of test piece}\,(cm)\,b}$

5、Tear strength T_S（ Kg / cm^2 ）＝ $\dfrac{\text{Max. load}\,(kg)\,F_S}{\text{Thickness of test piece}\,(cm)\,t}$

6、Tensile strength M_M（ Kg / cm^2 ）＝

$$\frac{\text{Load at specific elongation ratio}\,(kg)\,F_n}{\text{Section area of test piece}\,(cm^2)\,A}$$

(The n of Mn herein expresses specific elongation ratio (%), e.g. M300 denotes the tensile strength at 300% elongation ratio)

6、Finishing method of test results

6.1. The number of test results: The test piece provides four, but

insufficient, it may be three, or even two, in this case, need to indicate the number of test pieces.

6.2 Test results: tensile strength and elongation: tensile strength and elongation, arranged in order of the size of the measured values. Which is S1, S2, S3 and S4, in accordance with the following calculation:

a test piece 4 when: TB or EB = +0.1 0.5S1 +0.8 S2 (S3 + S4)

Test piece 3: TB or EB = 0.7S1 +0.2 S2 +0.1 S3

c test piece 2: TB or EB = 0.9S1 +0.1 S2

6.3 Resistance to stress: tensile stress expressed by the average of the measured values.

Record: in the test results on the table, you must record the following:

A. Tensile strength (Kg/cm2), elongation (%), tensile stresses (Kg/cm2).

B. Testing Machine capacity (capacity).

C. The shape of the test piece and the test piece No.

D. Test temperature.

E. Other matters necessary

7、Test software operation

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Chapter 1 Introduction for M221C

M221C test machine measurement and control system is measurement and control system that designed for universal testing machine, hydraulic universal testing machine. Can be used for tension, compression, bending, shear, tear, peel test, and so on. Using a PC and interface board for data collection, storage, processing and printing test results. Calculate the maximum force, yield force, the average peel force, maximum deformation, yield point, elastic modulus and other parameters; can be curve processing, multi-sensor support, graphical interface, flexible data processing, MS-ACCESS 2003 database support make the system more powerful.

M221C using Visual Studio. Net development, support for Windows XP/Win7 operating system;

Supports nine languages: Chinese Simplified, Chinese Traditional, English, Spanish, Russian, Japanese, French, German, Portuguese, arbitrary switching, field test data show the database name automatically translate the selected text to follow, the data under the local language to facilitate browsing, basically meet the use test machine in the world; Supports three types: SI International standard unit, kg-cm unit, Lb-Inch Imperial units, six commonly used system of units: N-mm-MPa, kN-mm-MPa, gf-cm-kgf/cm2, kgf-cm -kgf/cm2, Lb-Inch-kpsi, kP-Inch-kpsi, unit switch easily. The use of different regions to meet the standard. Communication with the USB2.0 interface, optically isolated, because they do not solve the cause of lead to the computer serial port or circuit board damage, to achieve the computer and test mechanical and electrical hot plug-plin.

Classcal privilege management for software used: tester level privileges, test management privilege, privilege testing machine manufacturer, taking into account the ease of use and security.

Specifications:

Measuring force:	
Resolution:	1 / 500000
Accuracy:	0.3%
Range:	1 N ~ 20000 kN
Sensitivity of the sensor:	1 - 40mV / V
Excitation voltage:	6VDC

Small deformation (electronic extensometer or strain gauge):

Resolution:	1 / 500000
Accuracy:	0.3%
Range:	1mm ~ 2000 mm

Sensor type: 2mV / V
Excitation voltage: 6VDC

Numeral large deformation (optical encoder):

Resolution: by tester and encoder decision; up to 5um
Precision: instrument system error-free.
Range: 0 ~ 20000 mm
Sensor type: AB-phase quadrature output optical encoder

position (optical encoder):

Resolution by the mechanical systems and optical encoder decision; generally up to 20nm
Precision instrument system error-free.
Range 0 ~ 20000 mm arbitrarily set
Sensor type AB-phase quadrature output optical encoders

Acquisition rate: 50 / Second

Speed control (on the electronic universal testing machine):
Control mode : pulse
Frequency range 0.1 Hz - 500 kHz
Accuracy : 0.05% (standard test points)
Resolution of 50kHz - 400 kHz 4%
5 kHz - 50 kHz 0.5%
1 kHz - 5 kHz 0.05%
0.1 Hz - 1 kHz 0.01%
With pulse input for the servo controller, stepper motor controller; to external F / V converter to fit
For AC inverter controller.

Use Conditions:

Temperature ： 10 - 35 ℃

Humidity 30% - 90%
Power 220 ± 10% Vac / 50 Hz / 0.2 A
Keep away from strong electromagnetic interference

Chapter 2 Hardware Installation and adjusting

Hardware installation:
M221 Pro interface, indicated in Figure 2-1:

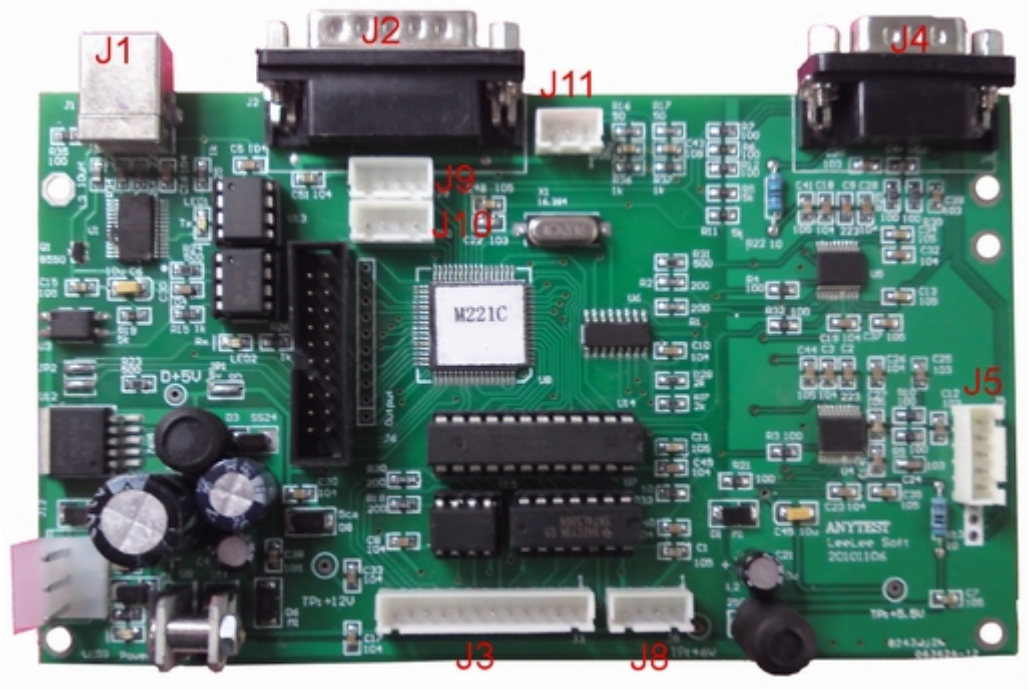


Figure 2-1

There are 10 connector J1, J2, J3, J4, J5, J8, J9, J10, J11, J12; Here plug connection:

J1 is a standard USB device-side interface, via a standard USB cable connected to the host **computer's USB port;**

J1 Pin No.	Symbol	
1	Vbus	+5 V power supply from computer
2	D-	serial data terminal -
3	D +	+ serial data ports
4	GND	Ground
Shell	Shell	shell, and connected

J2 is a DB15 connector, that is connected with the operation box;

J3 (used in electronic universal testing machine) is SIP12 connector for ① measured position servo speed control system with position encoder output is connected; ② servo speed control system with position servo input signal and speed limit control system connections;

J3 Pin Number	Function
1	+12 Vdc
2	Output overload protection, low effective
3	reserves
4	tester down move out, low effective
5	tester up move out, low effective
6	tester move direction output SIGN
7	tester speed pulse output
8	position encoder signal (from the servo speed controller) Input A +
9	position encoder signal (from the servo speed controller) Input A-
10	position encoder signal (from the servo speed controller) input B +
11	position encoder signal (from the servo speed controller) input B-
12	0V (GND)

Note: The position signal as measured with optical encoder, according to Figure 2-7 to connect; such as servo motor signals, according to Figure 2-2 and the J3 connector!

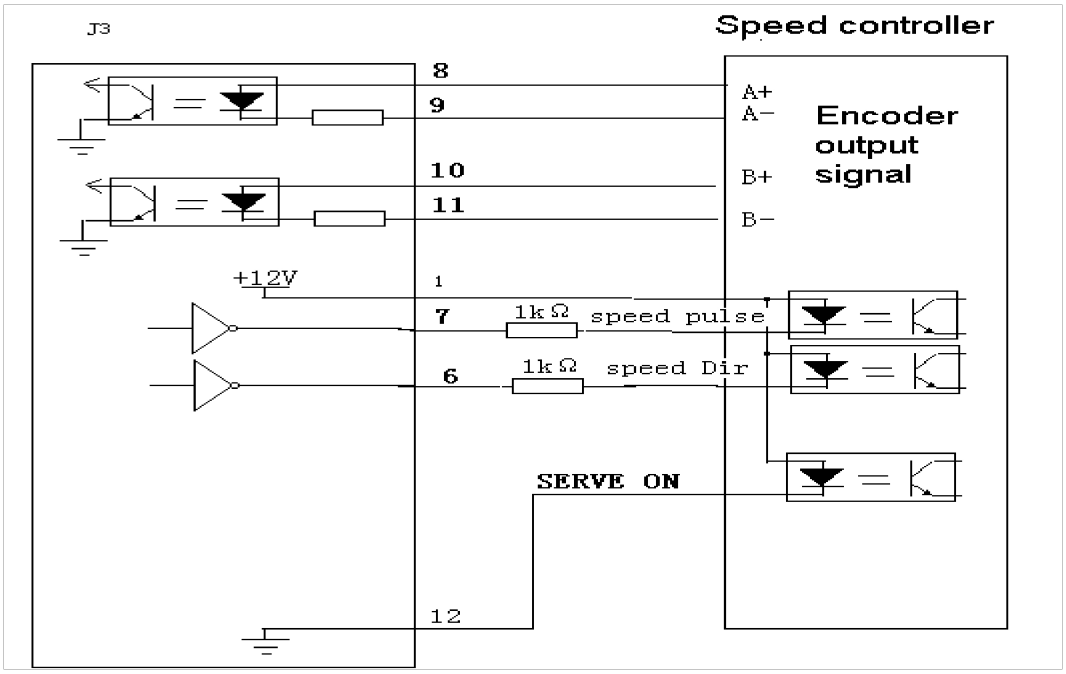


Figure 2-2

Note: Due to a variety of different ways speed controler link, as shown in Figure 2-4 does not necessarily have to adapt; specific, please contact the manufacturer.

J4 is DB/9M connector, and measure small deformation sensor connection:

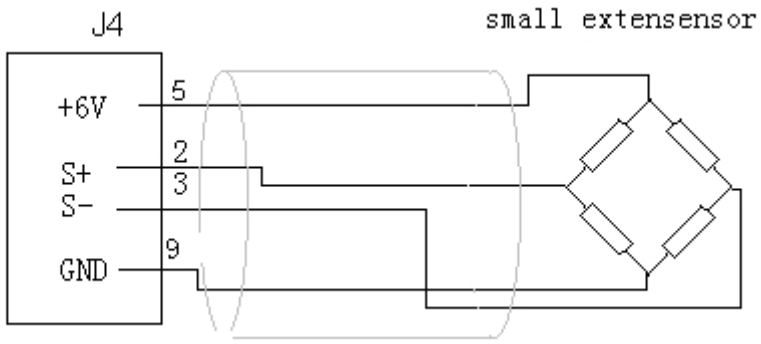


Figure 2-3

J5 is SIP5 connector for connection with the force sensor:

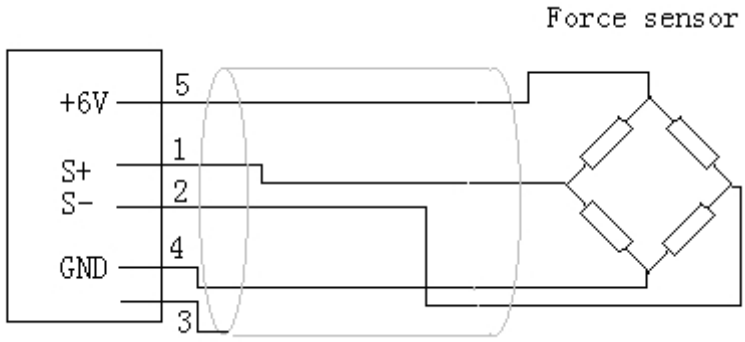


Figure 2-4

Connector J6 is SIP5 reserved

J7 is IDC20 connectors, retention

J8 is SIP4 connector for measuring position with optical encoder connection:

Pin	No.	Symbol Function
1	A	signal from the optical encoder input A
2	B	signal from the optical encoder input B
3	GND	0V
4	+5 V	+5 V

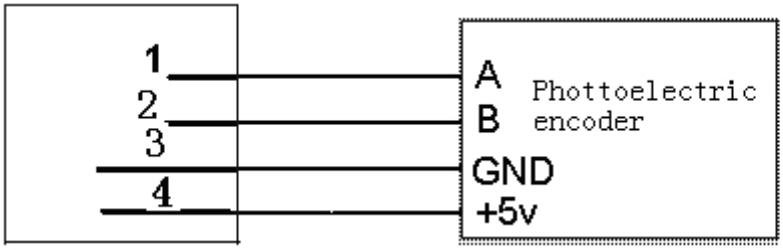


Figure 2-5

J9 is SIP4 connector for measuring large deformation with optical encoder 1 connection:

Pin	No.	Symbol Function
1	A	signal from the optical encoder input A
2	B	signal from the optical encoder input B

3	GND	0V
4	+5 V	+5 V

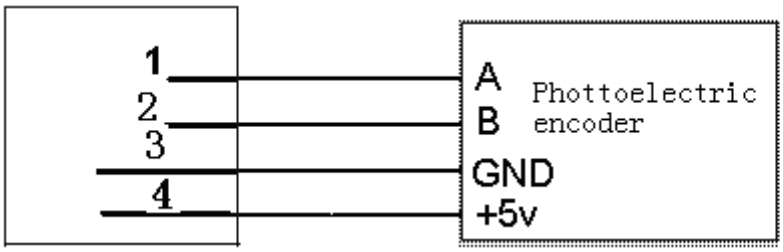


Figure 2-6

J10 is SIP4 connector for measuring large deformation with optical encoder 2 connection:

Pin	No.	Symbol Function
1	A	signal from the optical encoder input A
2	B	signal from the optical encoder input B
3	GND	0V
4	+5 V	+5 V

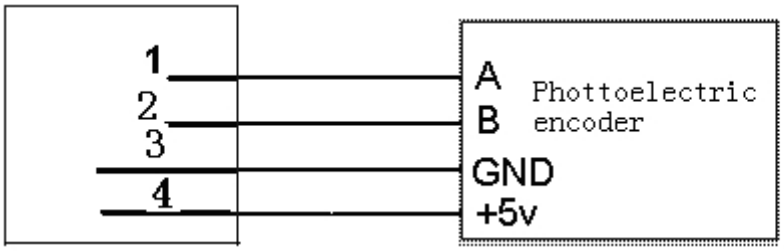


Figure 2-7

Note: The position signal as measured with optical encoder, according to Figure 2-7 to connect; such as servo motor signals, according to Figure 2-2 and the J3 connector!

J11 is SIP3 connector for connection with the limit switch:

Pin	No.	Symbol Function
1	L1	input signal from the up limit switch
2	L2	input signal from the down limit switch
3	GND	0V

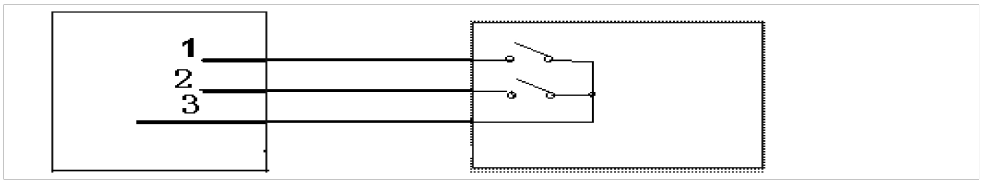


Figure 2-8

J12 is a two 12Vac power input, and the power transformer secondary connections.

Chapter 3 the software installation and introduction

I. Software Introduction

M221 connect with PC, you can get more powerful functions; extended test range. Software system is an advanced testing machine measurement and control system vsoftware, widely used in metal and nonmetal testing needs; graphical image of the user interface, MS-ACCESS database and SQL statements, VBScript expanded by the user of the report and the automatically calculated; modular programming, real-time curve display; it is a strong re-development function system; simple, reliable and flexible. Test is extremely powerful software.

Features:

A graphic image of the user interface: easy to use, mistake can be reduced through the voice prompts, to improve reliability.

B MS-ACCESS database and SQL technology: the data save, process standardization, easy connect with Intranet or Internet connection; easy with Word or Excel and other Office software interface; users can easily read standard database of test data.

C modular programming: VBScript to expand customized reports and automatic calculation of parameters of the program; allows users to secondary development, packages become available in addition to tension, compression, bend, tear, peel, shear testing other than those function.

D curve function: test the process of real-time graph shows the graph axis optional parameter types, in theory, there are 169 kinds of graphs can be displayed on the parameters from the curve.

E Multi-Sensor support: ability to support 5 sensor , 5 deformation,1 large deformation,1 position sensor, greatly expanded the scope of the study.

PC computer, the minimum requirements:

CPU 3.0 GHz
2 GB of memory
300 GB hard drive
Monitor with a minimum resolution of 1440 * 900 24-bit true color widescreen
USB interface
CD-ROM/DVD-ROM
Sound card and speakers, mouse
Color inkjet printer / Laser printer
WINDOWS XP / Windows 7 operating system
According to standard components listed above

M221Pro electrical testing machine measurement and control and control hardware and software for professional edition testing machine control system to realize the value of the force, deformation, the location of the

closed loop, electronic universal testing machine so that any curve can be controlled trial, such as low-frequency cycles (fatigue) test, step test, force keep (creep) test.

Comparison:

Function	Standard Edition	Professional Edition
Software platform	WINDOWS XP/Win7	WINDOWS XP/Win7
Test data storage	MS Access 2003	MS Access 2003
Report	MS RDLC	MS RDLC
Position control	Yes	Yes
Force control	No	Yes
Deformation control	No	Yes
Hybrid control	No	Yes
Cycle control	No	Yes

Whether ordinary type or professional, can be elastic modulus, yield point, given the amount of residual strength, elongation, anyone deformation, maximum strength calculation, and another special professional computing, such as conveyor belts stripping calculations, yield point elongation rate and so on.

ii M221 testing machine installation of measurement and control software

put the M221 testing machine to measure and control software CD CD-ROM, open the WINDOWS desktop, My Computer, select CD-ROM drive and open, open the folder \ M221C \, double-click execute the file SETUP.EXE to install, as shown in Figure 3 -1;

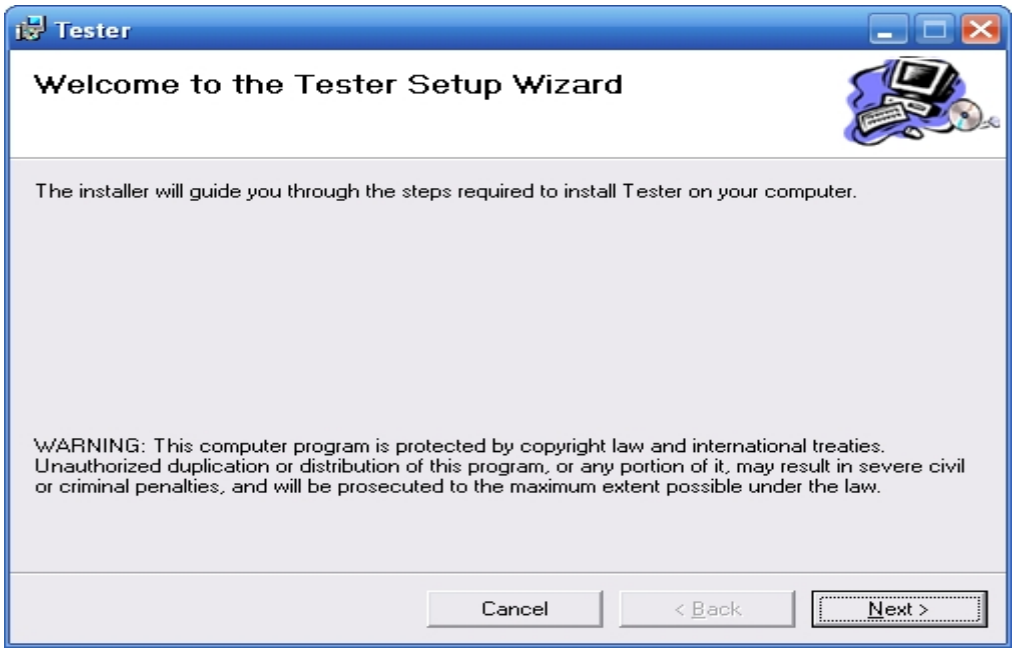


Figure 3 - 1

Click the Next button to display Figure 3-2;

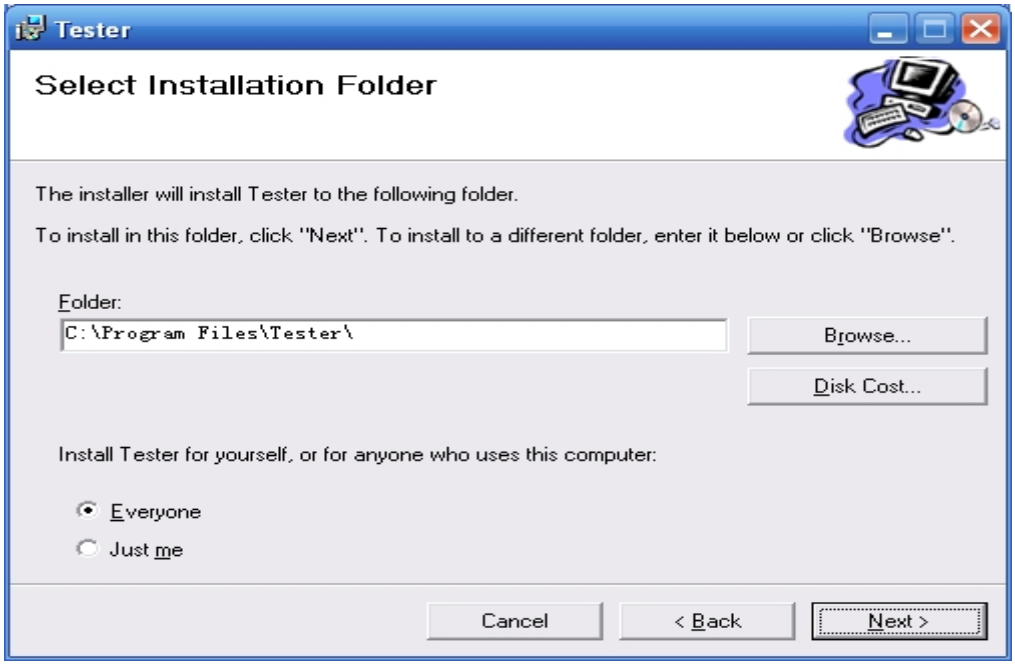


Figure 3 – 2

Conflict with the system files, such as tips, generally choose "Ignore"; such as prompts and system files to copy over the files updated, usually selected "reserved."

The default installation address please click D: \ anyTest \ setup, users select the default Everyone <everyone can use the>;

Click the Next button to display Figure 3-3;

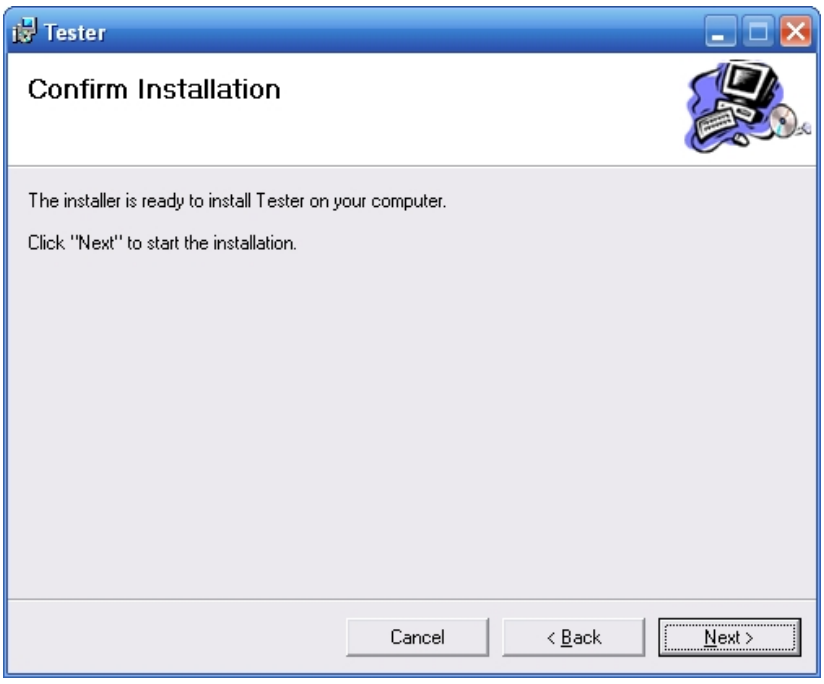


Figure 3 - 3

Figure 3-5 shows the installation is complete;

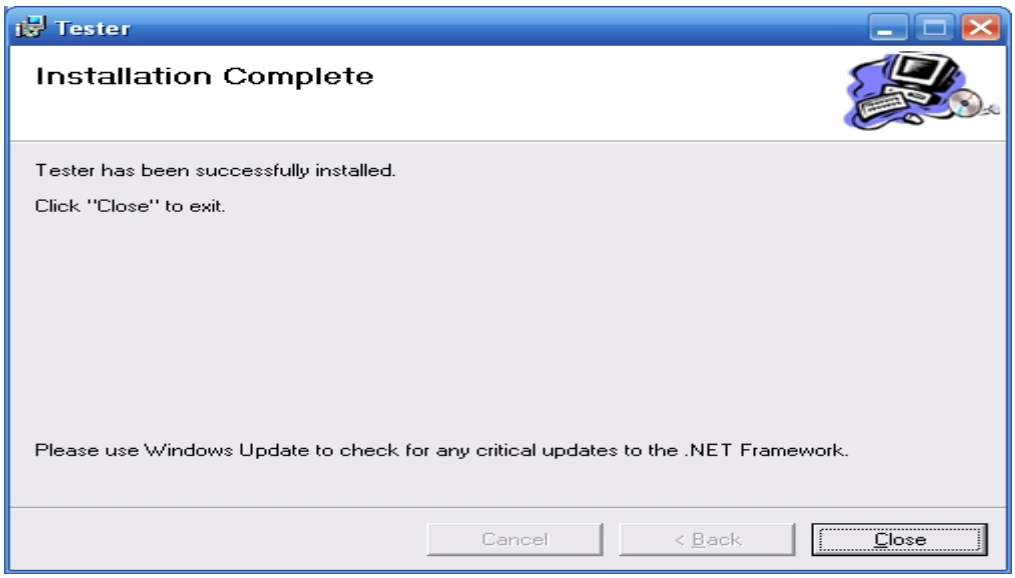


Figure 3--5

Click Close to complete the installation.

After installation is complete, in the WINDOWS XP, click Start \ All Programs \ anyTest to perform the installation of the test program; testing machine automatically create a desktop shortcut.

Thus, the testing machine has been completed the installation of measurement and control software.

Chapter 4 the use of software

Note: before power on, check the location of the testing machine is in the right upper Limit and lower Limit position to ensure that test move is in a safe location.

Prompts.

i run test program; Forms function

1 the login form

If you create a desktop shortcut on the desktop, double clicked Tester.EXE to enter the login screen;

If you do not create a desktop shortcut, perform WINDOWS "Start \ Programs \ Tester", enter the login screen as shown in Figure 4-1:

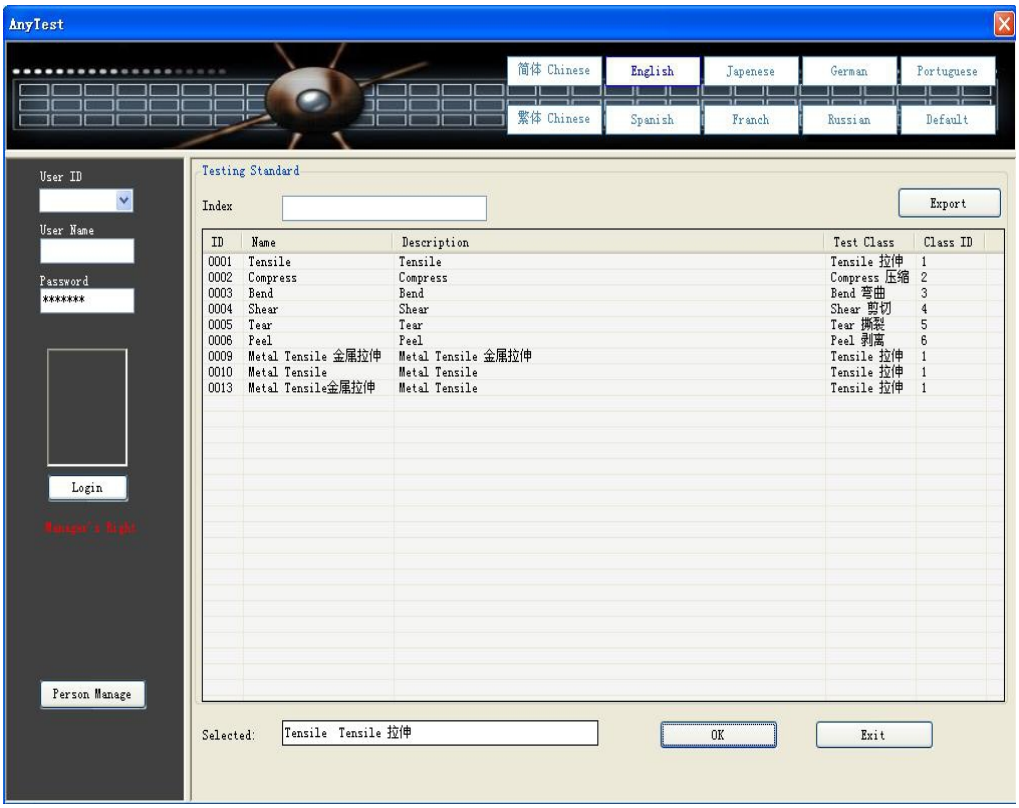


Figure 4-1

Login form function:

A selection test standards; the center table in the form desired rows with the mouse click, then click "OK" button to enter the main test form, you can double-click the desired line directly into the main test form, If there are multiple standards, index options are available;

B to exit the test procedure; click "Exit" button to exit the test program;

C language choice; the upper left position in the form of click language used, the system immediately translated form; into the system default language is the language of the operating system;

D user login; user rights management at different levels by: tester lelel, test management level, the test machine production level;

privilege as follows:

Functional level	test level	management-level	production
Test	●	●	●
Personnel management		●	●
System initialization		●	●
Database Field tool			●
Specimen shape tool			●
hardware settings			●
Hardware testing			●
force calibration value		●	●
position calibration		●	●

Deformation calibration	●	●
Lateral extensometer calibration	●	●
Test methods to create		●

2 main form

Figure 4-2

The main form is divided into the following sections: menu bar, shortcut bar, real-time values display, the graph shows, the results display, status display, information display, buttons part;

The following menus are display windows: force value display windows, force value display window shows the current force value in addition to the current operating status and also have shown the value unit; deformation display window, in addition to the display window shows the current deformation There deformation and unit;position display window shows the current position and unit, rating.

The main form is the real-time graph shows the central window, then the following is the results;

A file (F) menu functions; shown in Figure 4-3

Click the menu item File (F) or press Alt + F key to proceed with the following Figure 4-4, these menu items to complete test file creation, open, write, or exit to the login form;

① New,create a new test; into the input window, see entry form on the input;

② Open, to open the previous test data; into the dialog window as shown in Figure 4-3a, follow the prompts in the window choose the file to read information needed to file by selecting "Open" button to read the data file; data files extension is defined as follows:

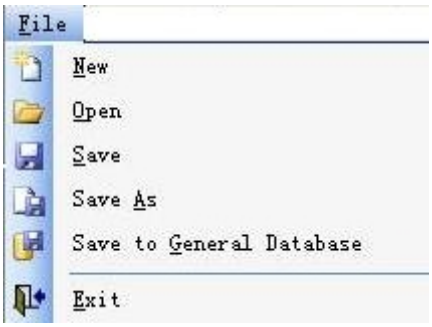


Figure 4-3

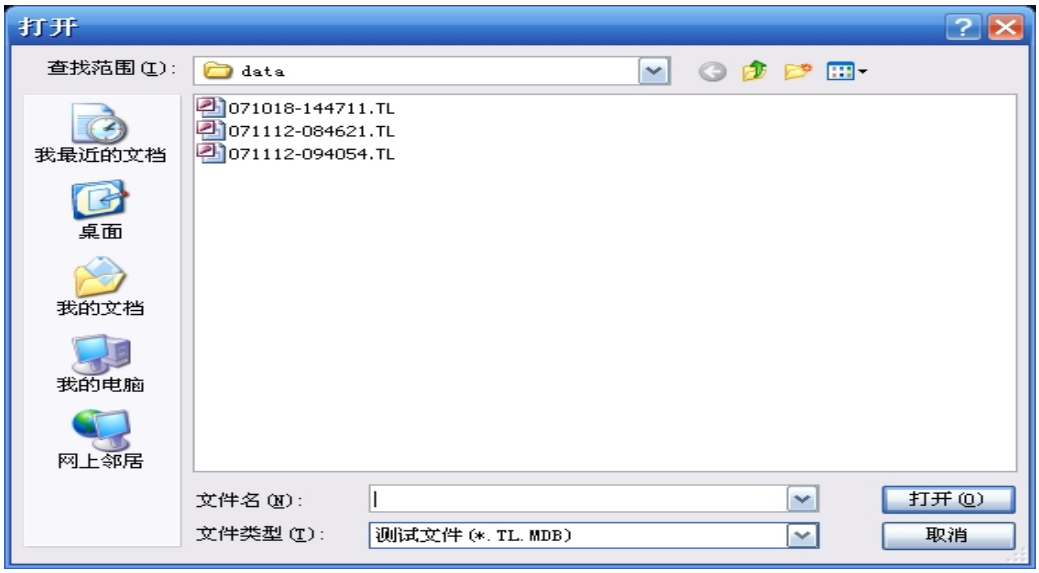


Figure 4 - 3a

. TL.MDB tensile test data
. TY.MDB compression test data
. TW.MDB bending test data
. TJ.MDB shear test data
. TS.MDB tear test data
. TB.MDB peel test data

③ Save, save the current test data; into the dialogue window, save test data process: enter the Save option will appear as shown in Figure 4-3b, there is a file name automatically generated file name, by the month, day - hours of composition; if it is the read file and then save the file, the file name defaults to the original file name. you can input the file name. Data file extension as above.

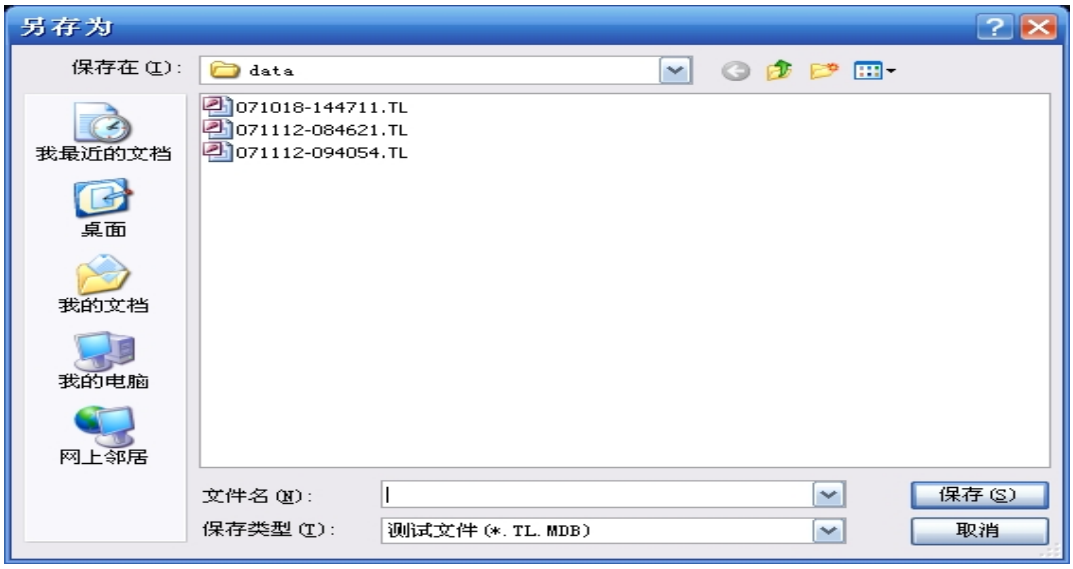


Figure 4-3b

④ Save As, to save the current test data for the specified file name;
⑤ Save to general database, the test data saved to the results of the total database;
⑥ exit, to exit the program test function, return to the login form;

B View(V) menu functions; shown in Figure 4-4

Click the menu item View(V) or press the key combination Alt + V to proceed with the following Figure 4-4, the menu items show / hide the main form in the graph, the results grid, select the curve, the interface refresh;

① curve(1), curve 1 show / hide: Click the menu item on the left of the selection to show/hide curve 1, shown in Figure 4-4a;
② curve(2), curve 2 show / hide: Click the menu item on the left of the selection to show/hide curve 2, shown in Figure 4-4a;
③ ④ results grid(R), to show/hide results grid ;
⑤ first curve (i), select first curve;
⑥ next curve (i), select next curve;

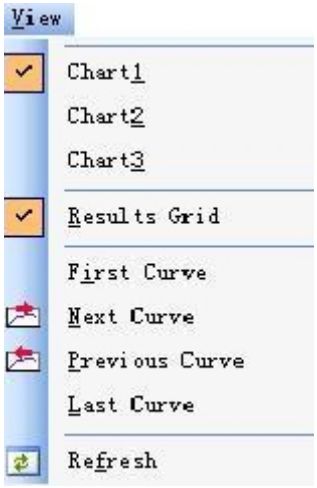


Figure 4-4

⑦ previous curve(P), select previous curve;

⑧ last curve(L), select last curve;
⑨ refresh (f), display refresh;

Figure 4-4a

C input (I) menu functions; shown in Figure 4-5
① Input (I), enter the input form;
② Remove(D), to delete the specified sample of the test data.

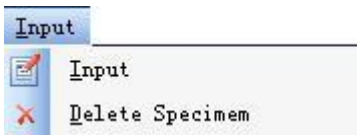


Figure 4-5

D Speed files(S) menu functions; shown in Figure 4-6
Select the speed file(S) items into the speed file form, see the speed of file the form;

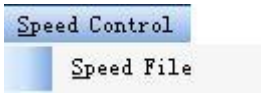


Figure 4-6

E test(T) menu functions; shown in Figure 4-8, the test (T) menu item in a form on the right of the button panel there is a corresponding button, as shown in Figure 4-9;

Figure 4-8

Figure 4-9

① fast up(t) tester move up with fast speed;
② fast down(D) tester move down with fast speed
③ Set Up(P) tester move up with set speed
④ set down(w) tester move down with set speed
⑤ run(R) test start, in left of the force value will see the running indicator, the curve drawn, the timer starts, at the bottom of the screen displays the text of the tested number of samples, after testing the results are displayed in the table;

⑦ pause(u) During the testing, pausing the test until the press run
⑧ Stop(S) there are two functions: in the standby state, the tester to stop moving; in running state, to end of the running, into the standby state; If set to automatically return, this time high-speed return to the start position;
⑨all clear (A) zeroing the force, deformation, position ; the same sensor can usually clear one time zero.
⑩force clear(F) zeroing the force, the same sensor can usually clear one time zero.
⑪position clear (C) zeroing position ; the same sensor can usually clear one time zero.
⑫ deformation Clear(L) zeroing deformation; the same sensor can usually clear one time zero.
⑬ length change(E) during the testing, remove the extensometer, switch to the position mode

⑭ position return(o)　tester cross to return to the position is zero;
⑮ force return zero(n) tester cross to return to force value is zero;

F calculate(a) menu functions; shown in Figure 4-10;

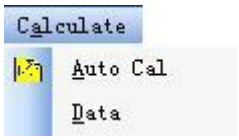


Figure 4-10

① recalculate(A)　selected recalculate , calculation form shown in Figure 4 - 10a, show the calculation process parameters;
② data(D)　to view the original test data, show the original data form shown in Figure 4 - 10b and Figure 4 - 10c, using the button "first", "Previous", "Next", "last "browse-by-sample.

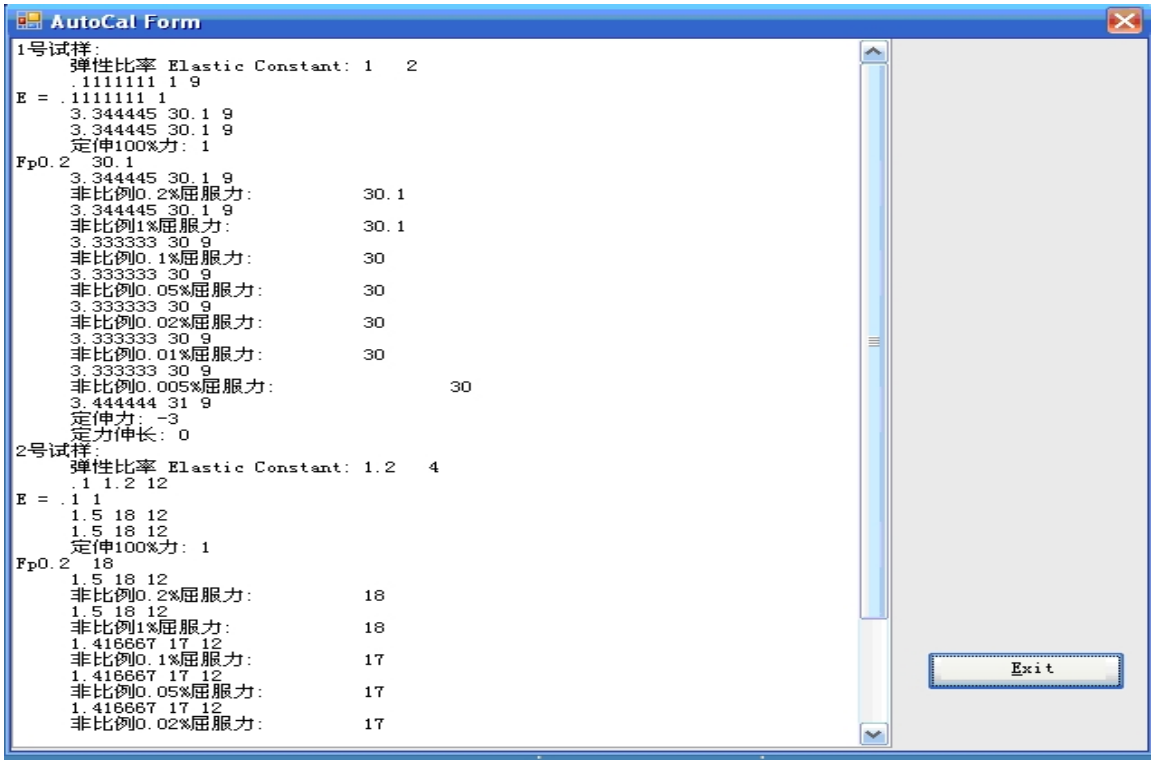


Figure 4 - 10a

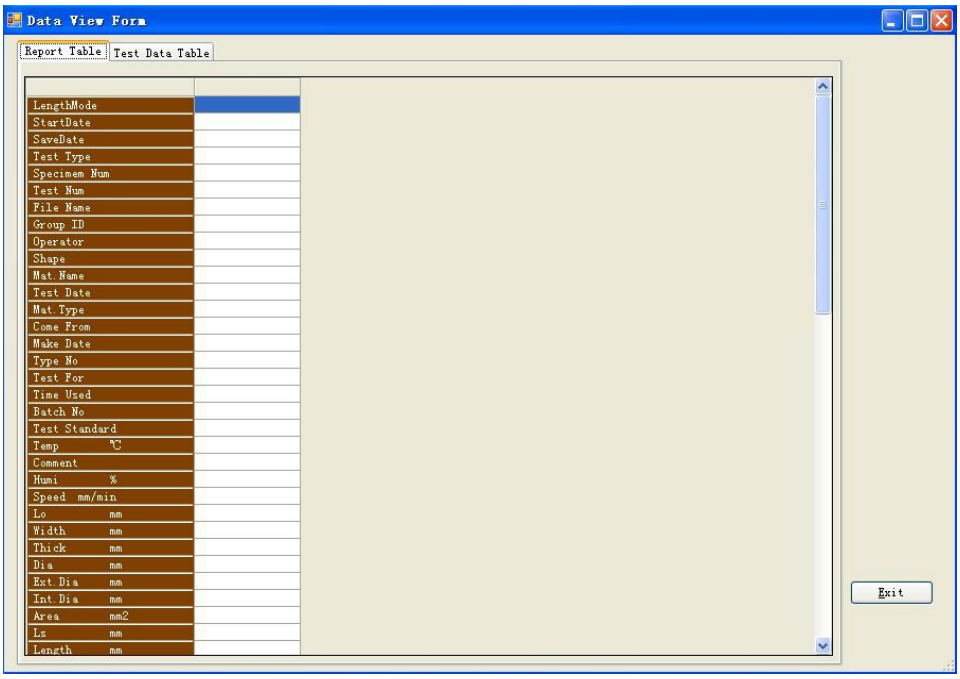
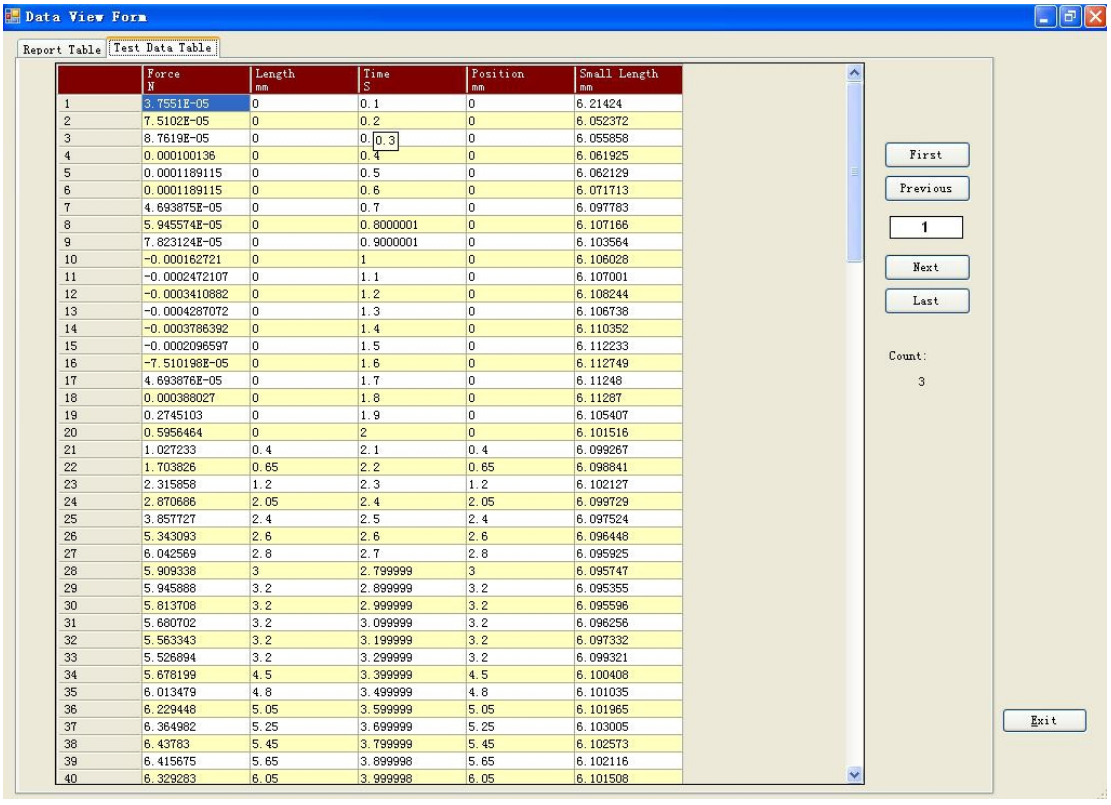


Figure 4-10b



	Force N	Length mm	Time S	Position mm	Small Length mm
1	3.7551E-05	0	0.1	0	6.21424
2	7.5102E-05	0	0.2	0	6.052372
3	8.7619E-05	0	0.3	0	6.055858
4	0.000100136	0	0.4	0	6.061925
5	0.0001189115	0	0.5	0	6.062129
6	0.0001189115	0	0.6	0	6.071713
7	4.693875E-05	0	0.7	0	6.097783
8	5.945574E-05	0	0.8000001	0	6.107166
9	7.823124E-05	0	0.9000001	0	6.103564
10	-0.000162721	0	1	0	6.106028
11	-0.0002472107	0	1.1	0	6.107001
12	-0.0003410882	0	1.2	0	6.108244
13	-0.0004287072	0	1.3	0	6.106738
14	-0.0003786392	0	1.4	0	6.110352
15	-0.0002096597	0	1.5	0	6.112233
16	-7.510198E-05	0	1.6	0	6.112749
17	4.693876E-05	0	1.7	0	6.11248
18	0.000388027	0	1.8	0	6.11287
19	0.2745103	0	1.9	0	6.105407
20	0.5956464	0	2	0	6.101516
21	1.027233	0.4	2.1	0.4	6.099267
22	1.703826	0.65	2.2	0.65	6.098841
23	2.315858	1.2	2.3	1.2	6.102127
24	2.870686	2.05	2.4	2.05	6.099729
25	3.857727	2.4	2.5	2.4	6.097524
26	5.343093	2.6	2.6	2.6	6.096448
27	6.042569	2.8	2.7	2.8	6.095925
28	5.909338	3	2.799999	3	6.095747
29	5.945888	3.2	2.899999	3.2	6.095355
30	5.813708	3.2	2.999999	3.2	6.095596
31	5.680702	3.2	3.099999	3.2	6.096256
32	5.563343	3.2	3.199999	3.2	6.097332
33	5.526894	3.2	3.299999	3.2	6.099321
34	5.678199	4.5	3.399999	4.5	6.100408
35	6.013479	4.8	3.499999	4.8	6.101035
36	6.229448	5.05	3.599999	5.05	6.101965
37	6.364982	5.25	3.699999	5.25	6.103005
38	6.43783	5.45	3.799999	5.45	6.102573
39	6.415675	5.65	3.899998	5.65	6.102116
40	6.329283	6.05	3.999998	6.05	6.101508

Figure 4-10c

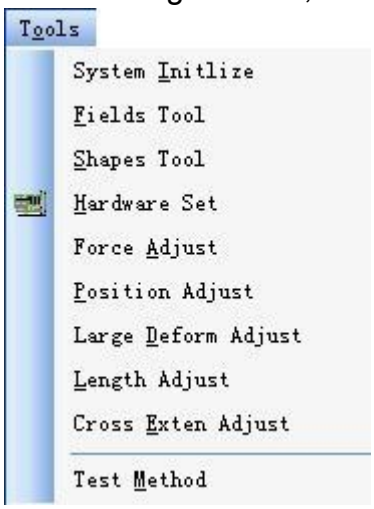
G Report(R) menu functions

① Internal Report(I)　Select the output common report with Microsoft RDLC report, shown in Figure 4-11.

Figure 4-11

② EXCEL report　　Select the output report with Microsoft EXCEL report.

H Tool(o) menu function, the menu under the privilege of the test level is hide; shown in Figure 4-12, in the different sub-items under different privileges level;



①system initialization(I), for the first use the system initialize: setting the value of force sensors, position sensors, deformation sensors, speed control, six basic types of testing class'sdirection and maximum speed, etc., see the initial system of the form;

②Database Field tool(F), for database field management, database using Access 2003 , but field's magement must managed under the field management form, because the fields need to set the name in different languages and different unit types, see the database management form;

③specimen shape tool(S) create or edit specimem shape, see the specimen shape form;

④hardware settings(H)　set the parameters of the M221 harware, see the hardware set form;
⑤force calibration(A)　calibrate the force sensor, see the calibration form;
⑥position calibration(P) calibrate position sensor, see the position calibration form;
⑦deformation calibration(L) calibrate deformation sensor, see the deformation calibration form;
⑧transverse extensometer calibration(E) calibrate transverse extensometer sensor, see transverse extensometer calibration form;

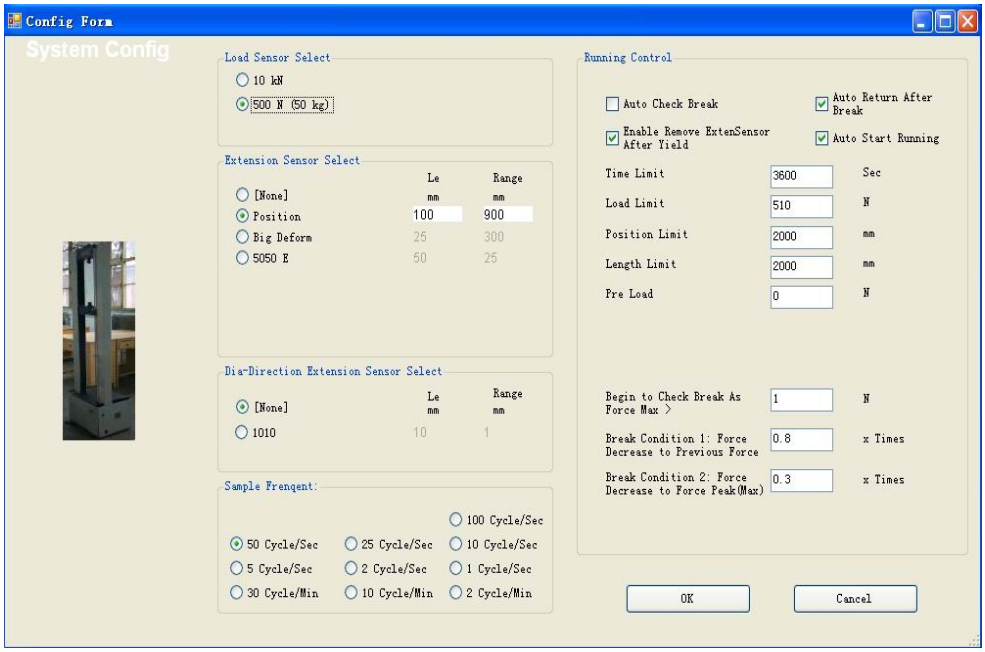


Figure 4-12

⑨test method(M)　create or modify test methods, test methods described in the management form.

3 configuration testing machine

When replacing a load sensor or deformation sensor, you need to change the operation control conditions, by clicking on the Configure button to enter the configuration window. In this window, select the desired load cell and deformation sensors, the control should be carefully configured to run:
Figure 4-13

4 Input test parameters form

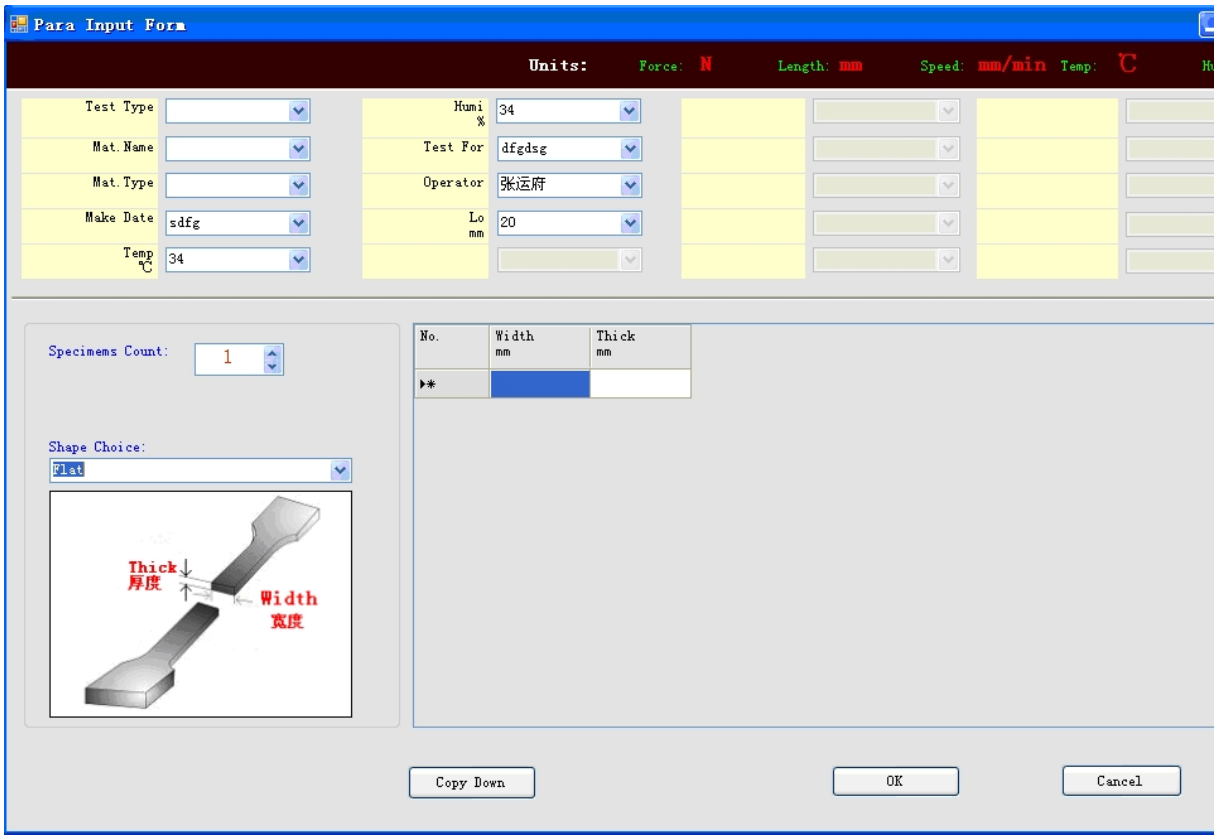


Figure 4-13

Form in the input test parameters above, there are 20 items for the input parameters of a total sample, each item have a arrow with a mouse click you can see the drop-down options are available, these options are previously entered parameters.

Test parameters in the input form below, there is a display grid for the input parameters of every specimen; the first sample input, simply press the "copy down" One sample parameters can be copied to the other samples.

5 Graph function

during the test, the curve for the main form used to display relation curve for force, deformation, stress, strain, time. in theory, can be configured for 169 kinds of graphs, real-time curve for data analysis, comparison, amplification, point to determine the parameters, print function. The following detailed description of the curve:

① Main form can be configured for no curve, a curve, two curves (see Figure 4-4a);

② each graph the X coordinate, Y coordinate choice of 13 types, there are 169 kinds of theoretical curve (see graph configuration form);

③ curve can be configured as a single curve, all curves display or display; single curve in the menu or shortcut keys with the "first curve" display first specimen curve, with the "next curve" display next specimen curve , with "previous curve" display the previous specimen curve, with the "last curve" display last specimen curve;

④ Curves can config to single curve or two curves, when the curve shows (curve 1) parameters can be displayed in label; parameter type must be marked with the same type of axis to display;
⑤ curve zoom in; use the mouse cursor to the upper left corner, press and hold the left mouse button and drag the right remains to be zoomed-in area until it reaches the lower right corner, release the button, the selected area was a rectangular box amplification; suppressed to keep the left button drag the curve to restore the original state;
⑥ curve background grid hide/display; use the menu item or shortcut key "hidden curve grid", "display the curve grid" to show or hide the grid graph.

6. Automatic calibration force value and automatic calibration deformation value

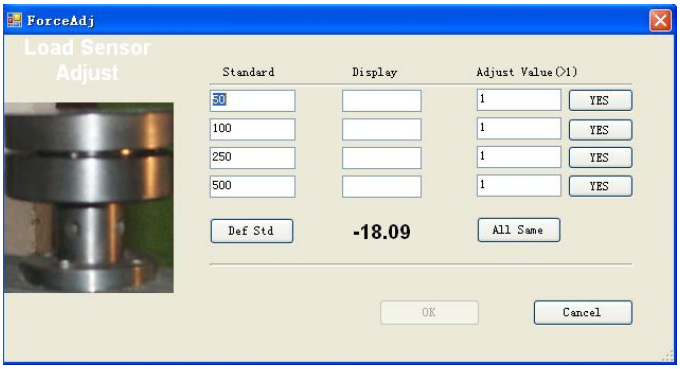


Figure 4-23

If you need to calibration force values, position, large deformation and small deformation, lateral deformation of small calibration, you must first log in the user login form and get a permission privilege before entering the main menu item "Tools"; in the tool drop-down menu items strong values, position, deformation, lateral deformation of the calibration of small windows;
①force calibration; before into force calibration form, should be cleared on the force value; into the form by setting the value of the calibration values to the test machine with standard load (weight or force measurement ring), then click corresponding to the line "OK" button, then you will see the results of the calibration coefficient calculation, four calibration coefficients from small to large machines to calibrate, after the test well; calibration coefficient is less than 1 is invalid, null and void the calibration factor is also that much difference ; settings can be adjusted a small amount, but not more than ± 20%; calibration factor can also be keyboard input.
② deformation the calibration and force calibration form is basically the same form; deformation type can only be calibrated for large deformation, one of the largest system, you can type;

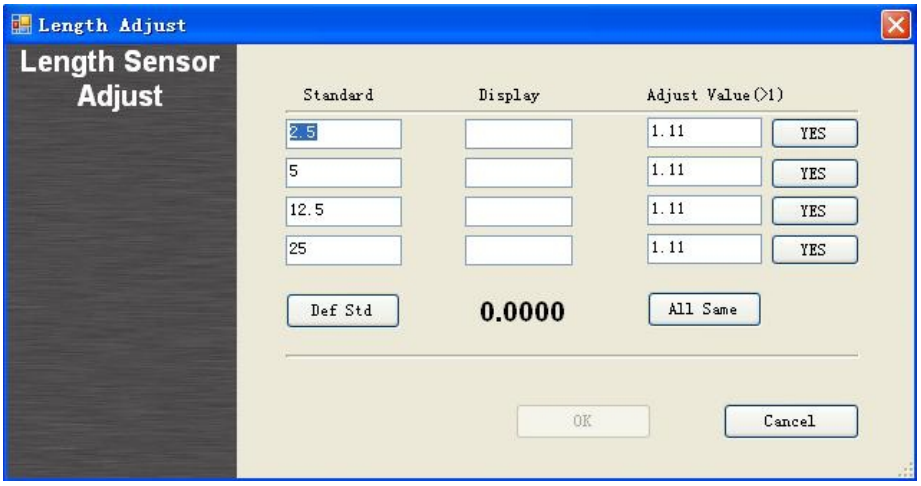


Figure 4-24

Large deformation calibration factor is calculated: calibration factor = optical encoder wheel diameter x 3.1416 / 4 / number of encoder points

③ position calibration form ; calibration system, you can type;

Figure 4-24

position calibration factor is calculated: calibration factor = screw pitch / 4 / number of photoelectric encoder Road

(Optical encoder mounted on the screw)

ii testing work

With these basics, you can start testing work;

NOTE: Check carefully before tester upper limit and lower limit position to ensure that test mobile will not cause harm to personnel and equipment. In front of the device should be an emergency stop switch, when there are any possible unforeseen circumstances, with the body parts of any possible impact of the emergency stop switch.

Test procedure:

1 start testing program; the login form on the screen;
2 in the login form, select the language, then click the required test standard table row, and then the OK button to enter the main test form; (only for testing do not need to log in , and if need calibration, system settings, database field management, specimen shape management, hardware setup, the standard test management, personnel management, we must follow the privileges)
3 Wait for connection between testing machine and computer; in the File menu, select New Item, enter the parameters of the sample in this group;
4 Check the required speed is set to test the speed, click on fast up, up, down,fast down and stop button, observe the tester whether normal move, manually operated up and down the instructions on the box is normal;
5 If replace the force or deformation sensor you need config, select the sensors and operating parameters;
6 install a specimen;
7 set the desired speed value;
8 Press the run button to test;
9 If set automatic check break, when the specimen breaks, the test cross can detect break; if not set to automatically determine break, test need to press the stop button after the break;
10 After the test, if set to automatically back the test cross will return to the starting point, the error is generally less than 0.1 mm; Please note that setting automatically returns to pay attention to the safety of personnel and equipment, not for the test sample after the end of automatically from the fixture off the sample generally do not like the metal is set to automatically return; automatically return to a dangerous situation not set to automatically return;
11 Repeat the above 5 - 9 until a complete testing;
12 In the report menu, select an internal report on the first screen, scalable browser, click the printer icon to print; then exit back to the data processing forms;
13 In the data processing form, press the Back key to return to the main form;
14 under the main form to save the file by writing test data.
15 test is completed, select the File menu option to exit the main form of exit and return to the login form;
16 in the login form, if the other tests, go to step 2; If you want to exit, press the eject button.

iii the use of box operation

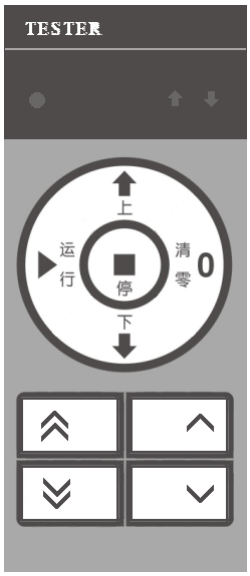


Figure 4-25

Operation on the box
"**Up**" on the main form is faster; this key dependent on computer software, system connected to be effective.
"**Down**" is the main form under fast; this key dependent on computer software, system connected to be effective.
"**Stop**" is a stop on the main form; this key dependent on computer software, system connected to be effective.
"**Run**" is running on the main form; the key dependent on computer software, system connected to be effective.
"**Clear**" is clear on the main form; this key dependent on computer software, system connected to be effective.
"**Micro up**" jog mode: when press tester up with a very slow speed, release to stop
"**Micro down**" jog mode: when press tester down with a very slow speed, release to stop
"**Slow up**" jog mode: when press tester up with a slow speed, release to stop
"**Slow down**" jog mode: when press tester down with a slow speed, release to stop.

Chapter 5 system initialization settings

When produce test machine, the software must first initialize the settings, including the value of force sensors, position sensors, large deformation sensors, small deformation sensor, transverse deformation of the sensor to add, delete, run on six types of test direction, the maximum speed, direction sensor set functions.
Note: The system initialization settings must have administrative privileges or the

producers permission to log in the login form set function to initialize the system works!

I enter the system initialization settings

Run the test program into the login form, as shown in Figure 5-1;

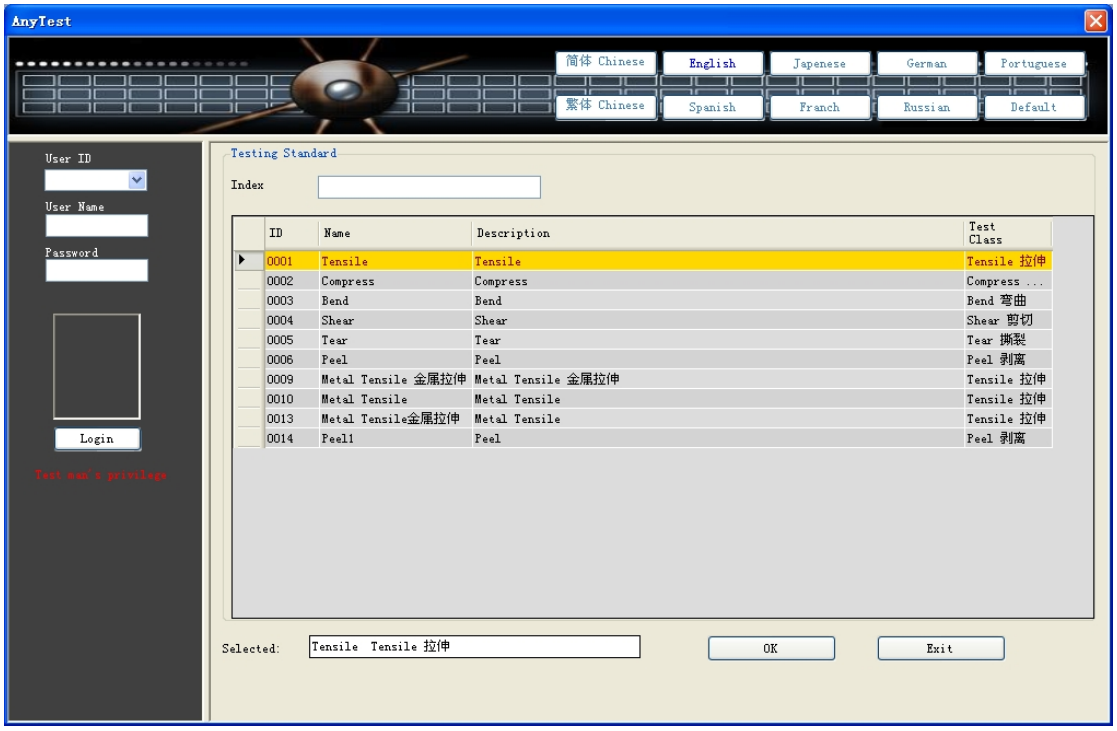


Figure 5-1

1, select the user ID, password and click Login button to display the "management privilige" text;

2, choose a test standard, press the OK button to enter the main form;

3, in the main menu click on Tools, Options form, shown in Figure 5-2;

4, click the option to enter the system initialization, system initialization form, as shown in Figure 5-3;

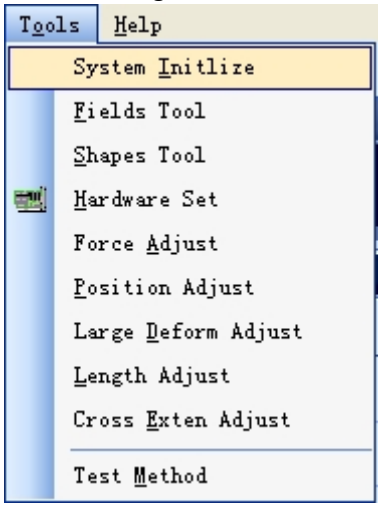


Figure 5-2

Figure 5-3

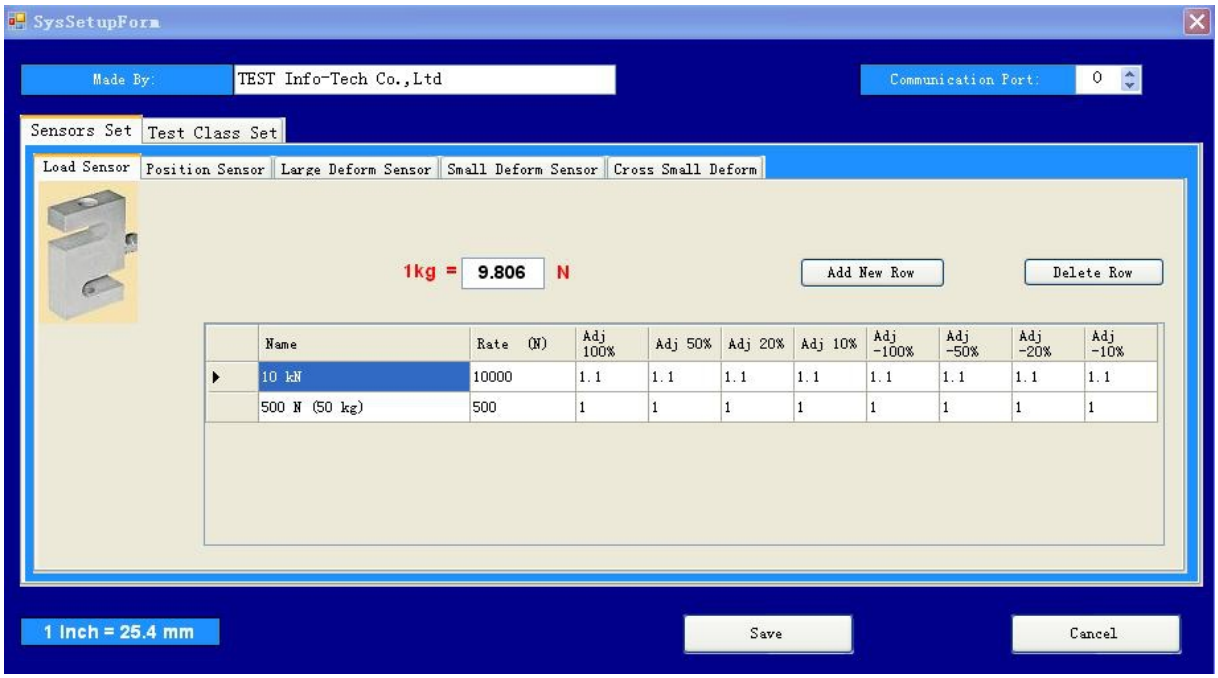


Figure 5-4

II the system initialization settings

Fill test and manufacturer manufacturers, communications generally set to 0.

1, the force value of the sensor set

① Set the acceleration of gravity: the value according to the local acceleration due to gravity fill the text box in Figure 5-5;

Figure 5-5

② Adding new sensors: Press the button to add a new row in the table to generate

Line, enter the name of the representative of the sensor values in the name of the rating units in the input rating of N, eight factor enter the calibration factor of 1.1.

③ Remove Sensor: to delete the selected line by delete button, the row will be deleted.

④ Edit sensors: data in the table can be edited directly.

⑤ If the only force to set the value of the sensor, press the Save button to save, to cancel if you press the button to cancel the set.

2, the position sensor setup shown in Figure 5-6

① add position sensor: Press the button to add a new row in the table to generate a row, enter the rating in **mm** rating, in Lo (original gauge), enter the value in **mm**, the calibration factor by Tip calculation.

② Remove Sensor: to delete the selected line by delete button, the row will be deleted.

③ Edit sensors: data in the table can be edited directly.
④ If only position sensor settings, press the Save button to save, to cancel if you press the button to cancel the set.

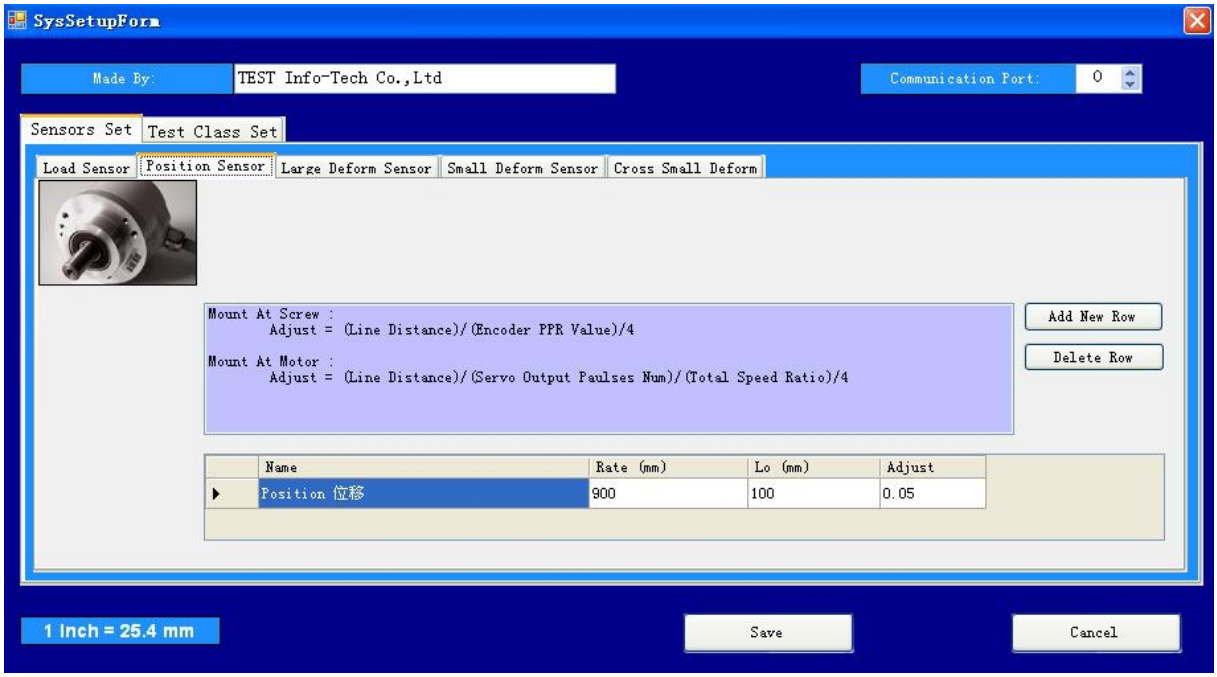


Figure 5 - 6

3, large deformation sensor setup shown in Figure 5-7

① add large deformation sensors: Press the button to add a new row in the table to generate a row, enter the rating in **mm** rating, in Lo (original gauge), enter the value in **mm**, according to the calibration factor Tip calculation.
② Remove Sensor: to delete the selected line by delete button, the row will be deleted.
③ Edit sensors: data in the table can be edited directly.
④ If only large deformation sensor settings, press the Save button to save, to cancel if you press the button to cancel the set.

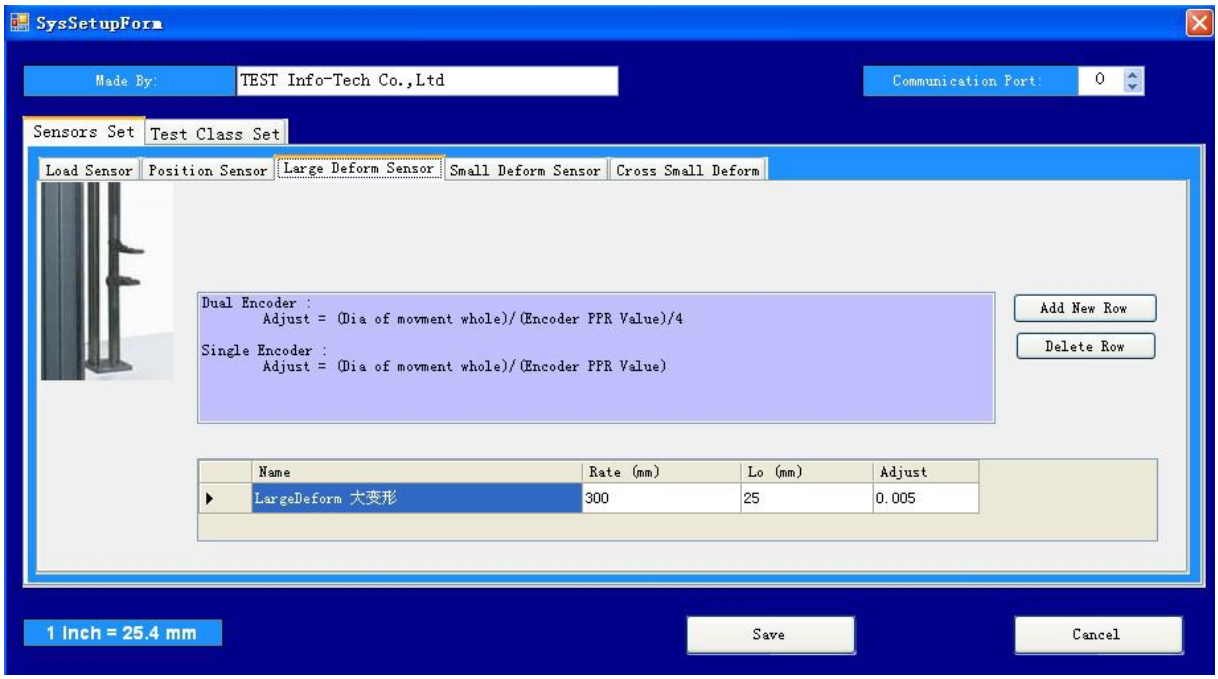


Figure 5 - 7

4, a small deformation of the sensor set in Figure 5-8

① add small deformation sensors: Press the button to add a new row in the table to generate a row, enter the name of the representative of the sensor values in the name of the rated input in **mm** in the ratings, in Lo (original gauge) in the input values in **mm**, 8 factors enter the calibration factor of 1.1.

② Remove Sensor: to delete the selected line by line button, the row will be deleted.

③ Edit sensors: data in the table can be edited directly.

④ If only a small deformation of the sensor settings, press the Save button to save, to cancel if you press the button to cancel the set.

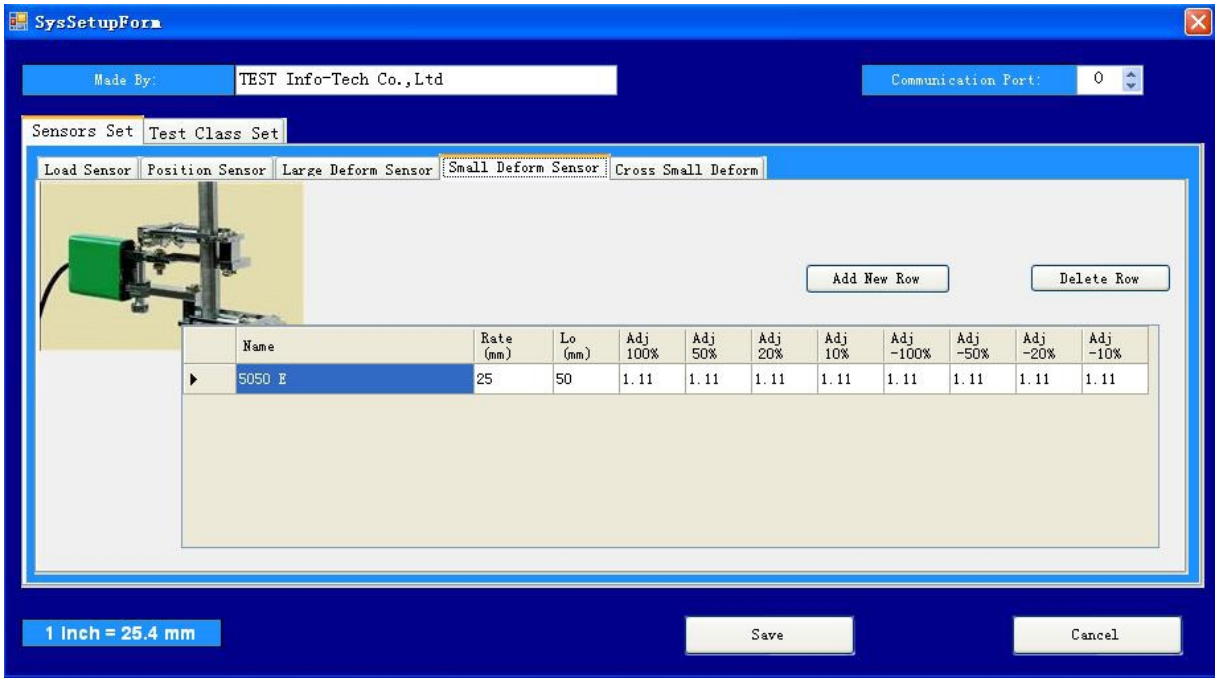


Figure 5--8

5, the transverse deformation of the sensor set in Figure 5-9

① add transverse deformation sensors: Press the button to add a new row in the table to generate a row, enter the name of the representative of the sensor values in the name of the rated input in **mm** in the ratings, in Lo (original gauge) in the Enter the values in **mm**, 8 to enter the calibration factor of 1.1.

② Remove Sensor: to delete the selected line by delete button, the row will be deleted.

③ Edit sensors: data in the table can be edited directly.

④ If only the transverse deformation of the sensor settings, press the Save button to save, to cancel if you press the button to cancel the set.

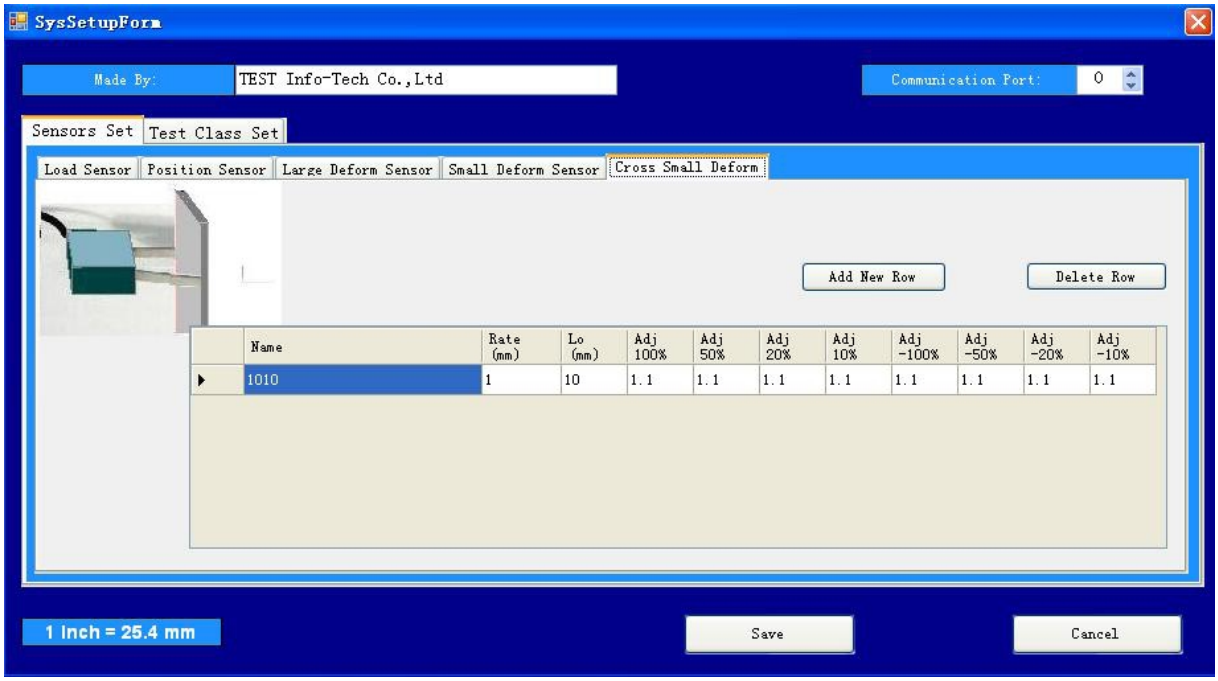


Figure 5 - 9

6, the test class as shown in Figure 5-10

M221 in all test standard are divided into subordinate to six classes: tension, compression, bending, shear, tear, peel; can be set separately for each class:

① force sensor value is reverse, check the box on the reverse, uncheck the check box is not the reverse.

② running direction of the test, running move direction UP movement, or down (Down) movement to pull down the selection;

③ maximum speed, up and down the maximum speed.

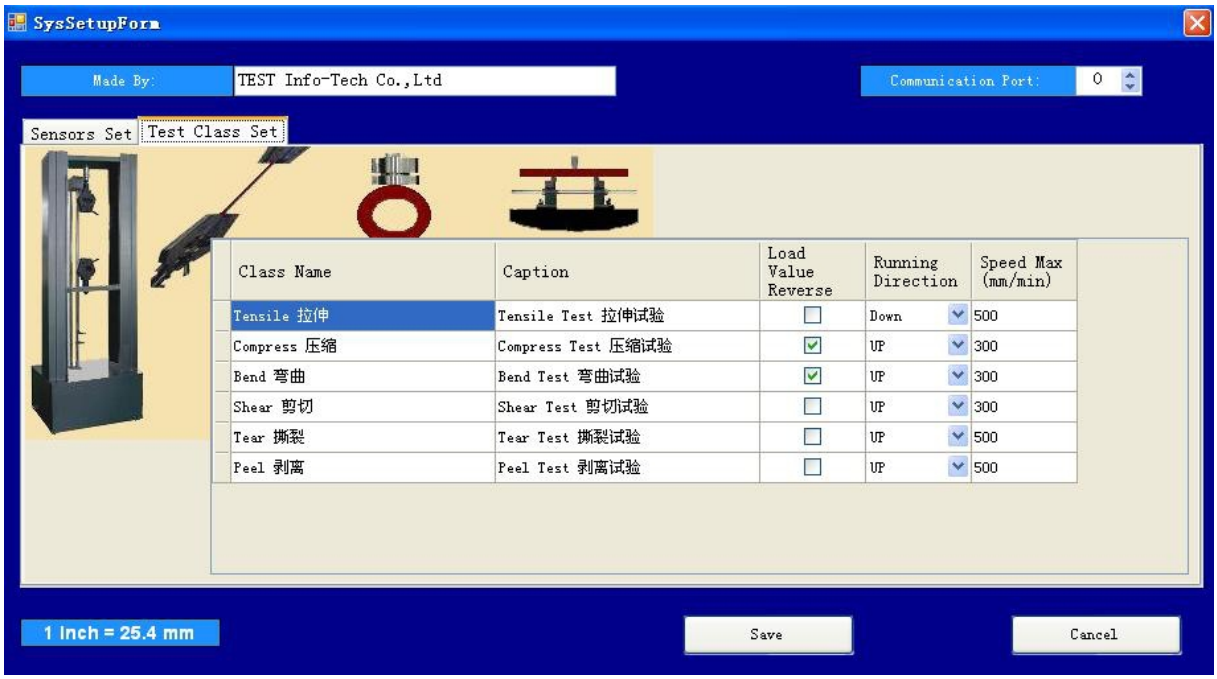


Figure 5—10

Chapter 6 Create test standards and edit report

There have been some testing standards for use after software installation , but often need to create or edit a number of standards to meet the new requirements;

Constitute a standard or test method requirements:

1 The test standard or method belongs to which type of test, test types are: tension, compression, bending, tearing, peeling;

2 Name; the test standard or method name;

3 localized name; the test standard or method of localized name;

4 pre-loaded; the pre-loaded on testing;

5 reports; the test standard or method to use report output;

6 speed control; the test standard or method tests the value of speed or speed file;

7 Public input parameters table; input parameters of a sample of the public; the input parameters in this table form the input parameters; the parameters in this table is reported in the page head part of the report;

8 Sample input parameters Table; input parameters for each individual sample; the input parameters in this table form the input parameters;

9 Output parameters Table; output each specimem's detail parameters; output these parameters in report's detail section.

Note: using this chapter must have administrative privileges or the producers permission from log in the login form!

A enter standard form

Run the test program into the login form, as shown in Figure 5-1;
1 Select the User ID, enter a password, click Login button to display the "management rights" text;
2 Select a test standard, press the OK button to enter the main form;
3 in the main menu click on Tools, Options form, shown in Figure 6-1;
4 Click the option to enter the test methods test methods form, as shown in Figure 6-2;

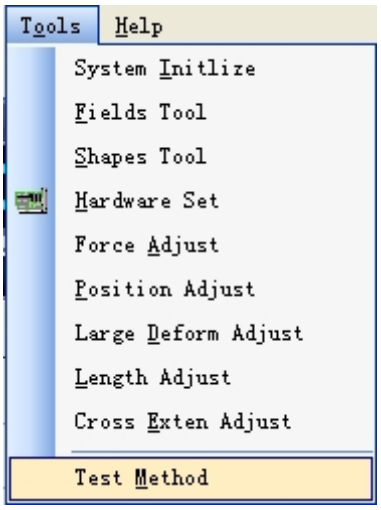


Figure 6-1

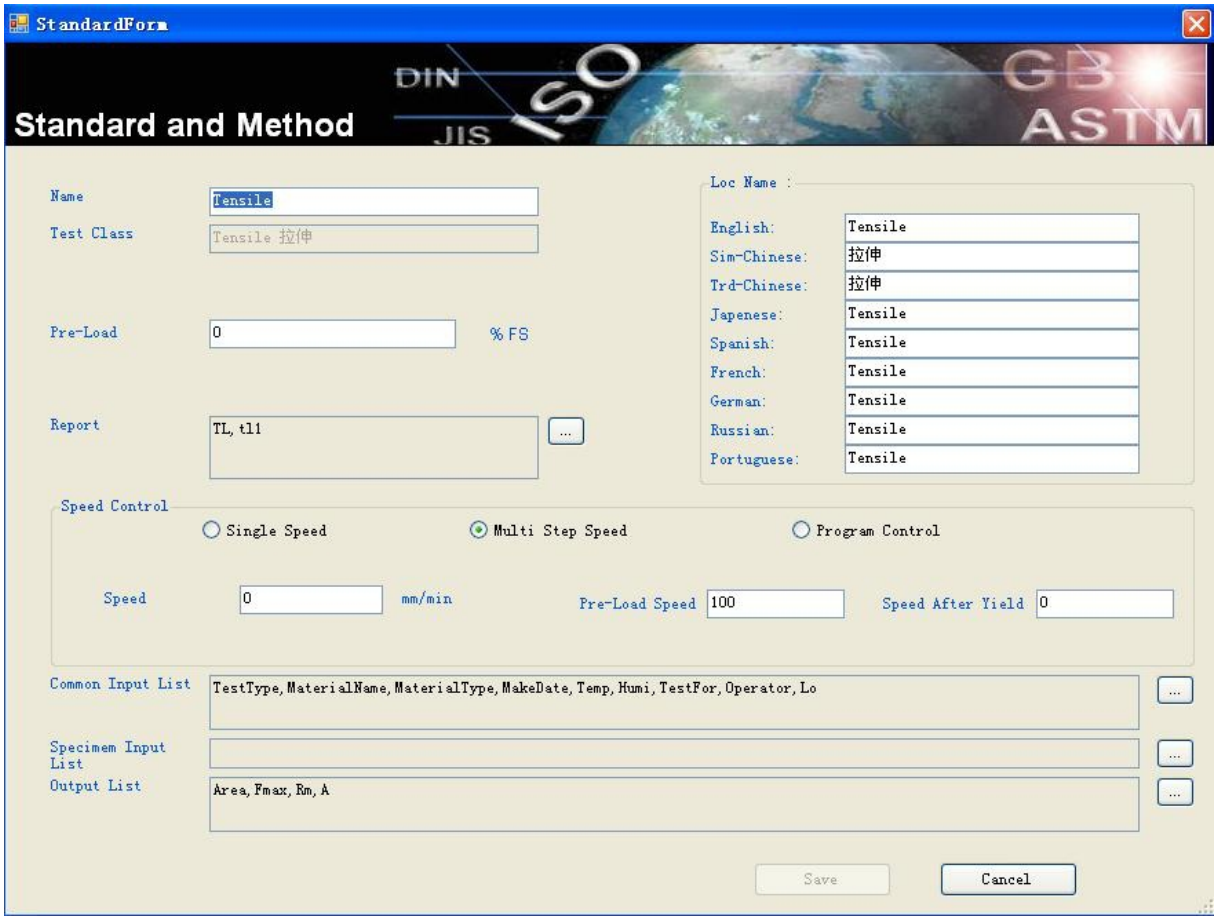


Figure 6-2

B, create test standard or method

1, test class settings

Test classes include: tension, compression, bending, shearing, tearing, peeling,

Test class determined by the selected test method in login form, if you want to establish standards or test methods and test classes do not match, please return to the login form to re-selected.

2, the name, the name of the test standard or method

3, the local name, were named in different languages, so that the translation in different languages;

4, report; report for the test standard or method; click the button to display the report list, as shown in Figure 6-3; if you want to select a report, click on the right candidate to join a collection of report name, press the button; finished, press the OK button, if you choose cancel button to cancel.

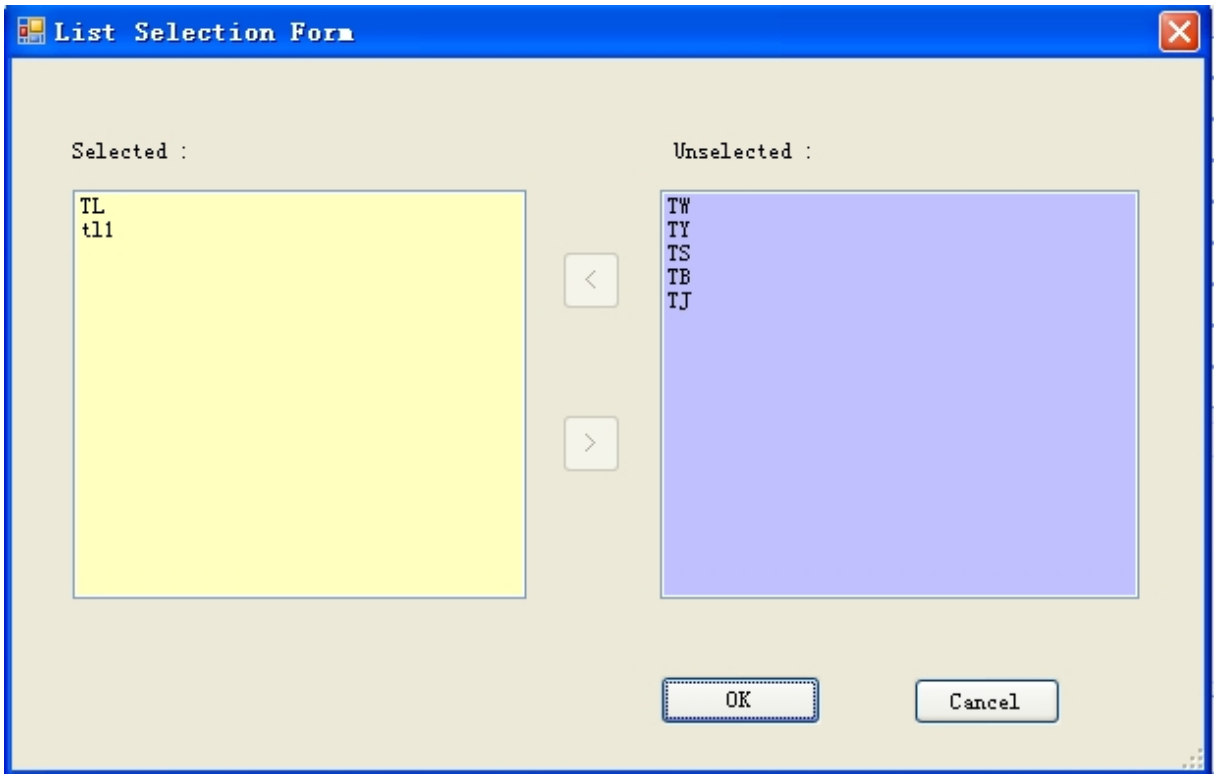


Figure 6--3

6 speed control; the test standard or method of test speeds or speed file; choose a single speed, multi-speed, process control (Professional edition only); single speed is the most common way to speed ,in testing the speed is not change. the return speed is the maximum speed of its test class; multi section speed control the pre-load speed and the speed before yield and the speed after yield, the

return speed is the maximum speed of its test class;

7 Public input parameters Table; input parameters of a sample of the public; the input parameters in this table determine the input parameters; the parameters in this table is reported in the head part of the report;
Click the Parameters button on the right, select the display list form, as shown in Figure 6-4; If you want to remove a parameter, click on the left has chosen to remove the line, press the button; if you want to add a parameter, on the right Click on the candidate set to join the line, press the button; finished, press the OK button, if you choose to cancel press cancel button.

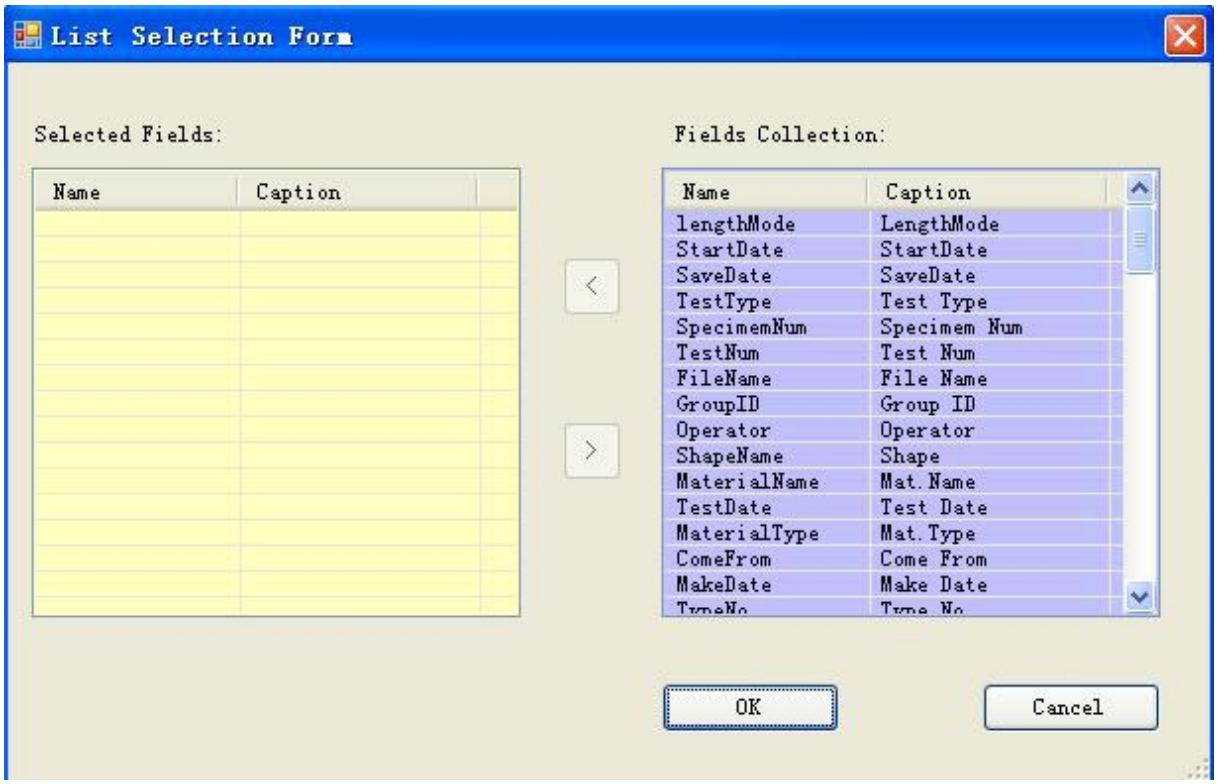


Figure 6--4

8 Sample input parameters Table; input parameters for each individual sample; the input parameters in this table determine the input parameters;
Set the same way as described in the previous 7;

9 Output parameters Table; this table's parameters output in the report that is detail part of the report;
Set the same way as described earlier 7.

10 completed, press the OK button, if you choose cancel button to cancel.

III, report editor

After edit the above parameters you click report edit, shown in Figure 6-5

Figure 6-5

Report is divided into four parts: title part,head part, details part,footer part.
1, the title part: You can enter the main title, subtitle, number of report, secondary text, arranged title text left or center or right align ; Also in the program folder has a picture file LOGO.JPG as part of the report title Background images can be placed, such as LOGO icon.

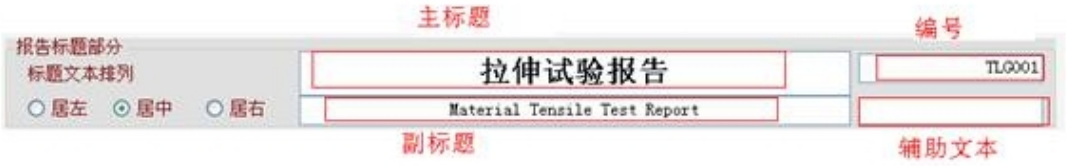


Figure 6 - 6

2, report head part; this part only displays the selected head part items in previous form, and there is a option to enable display the report grid lines;
3 report detail part;display report detail part's fields; set the rounding unit, valid scope of the field; units are fixed, can not be changed;
rounding unit defined numeral value's rounding method, according to "4 abnegate 6 carry 5 odd/even",
If the value 1.245, 1.251, 1.25, 1.35 spacing 0.1 of the Statute by statute, the result is

1.2, 1.3, 1.2, 1.4
if selected [F-SYS] results rounding according to the value of force sensor rate.
if selected [GB228-R] results rounding according to GB228 standard definition of the strength of the Statute of the standard value

valid minimum: If the result is less than the value , parameter results show the background to red
valid Maximum: If the result is greater than this value, the results show the background color to chrysanthemum

Print style check box, select to Print specimem's parameters in detail part or not;

Group box, select to print by grouping the results or not;

4 report foot part, of the summary report select the type of aggregates for option.

5 page foot part of the report, is fixed, as shown in Figure 6 - 7

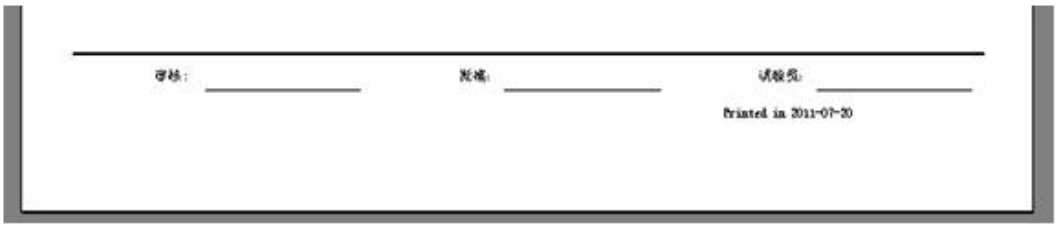


Figure 6 – 7

Chapter 7 create specimen shape

Software has been installed for use of some specimen shapes, but often need to create or edit the sample shape to meet the new requirements;
Constitute a sample requesting:
1 name; name of the shape;
2 localized name; the localized name of the specimen shape;
3 Parameters; form a specimen shape need to enter those parameters;
4 pictures; shape picture.
5 sample shape have different specimen shape in different test class.
Note: The system initialization settings must have administrative privileges or the producers permission to log in the login form set function to initialize the system works!
A Enter into the form for the shape of the specimen
Run the test program into the login form, as shown in Figure 5-1;
1 Select the user ID, password and click Login button to display the "management privilege" text;
2 Select a test standard, press the OK button to enter the main form;

3 in the main menu click Tools, Options form, shown in Figure 8-1;
4 Click the specimen shape tool menu into the specimen shape tool form, as shown in Figure 8-2;

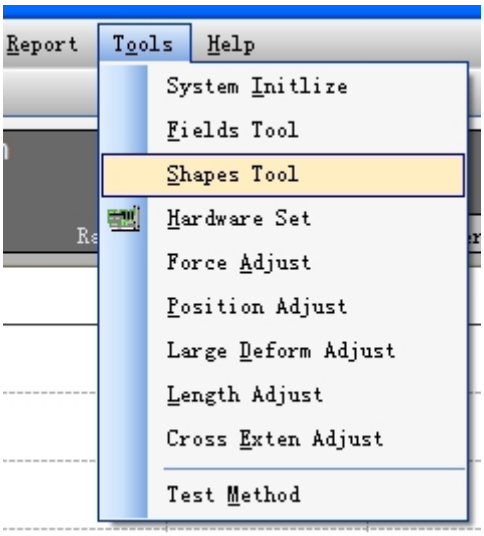


Figure 7-1

Test classes include: tension, compression, bending, shearing, tearing, peeling,

Testing and test class corresponding to the shape of the collection, the login form login selected test class, if you want to create test shape does not match test class, please return to the login form to re-selected.

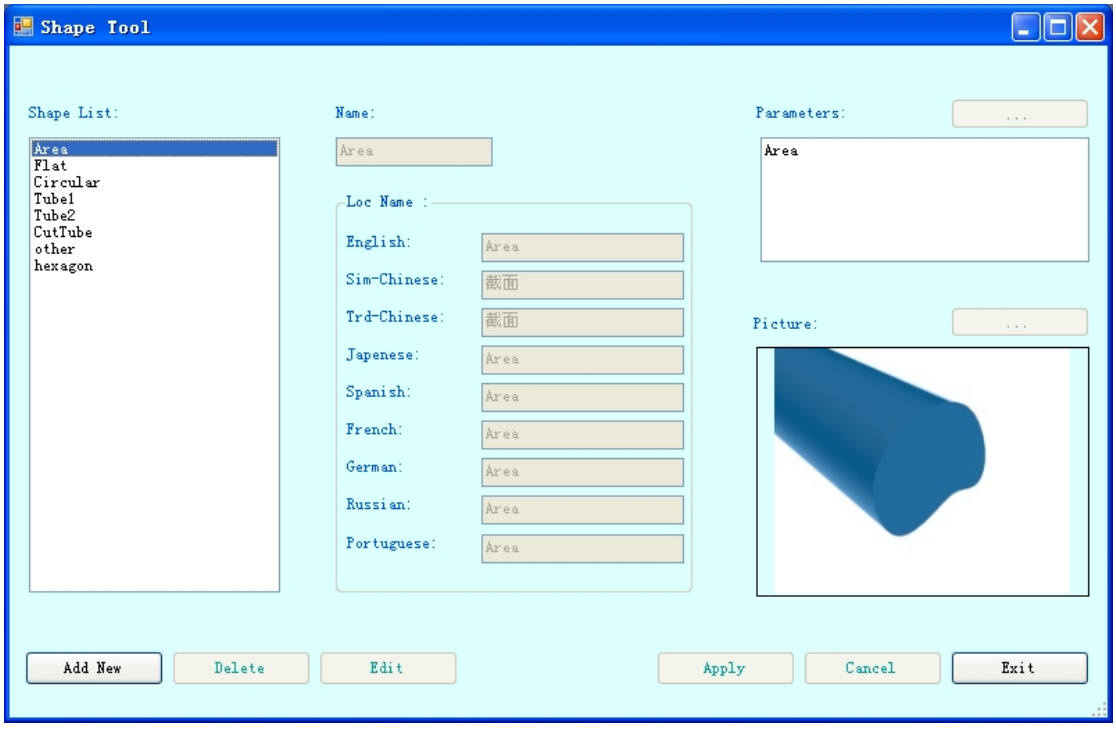


Figure 7-2

B the creating of the specimen shape

1, click Add New button, input the name, the local name input box enabled

to input;
2, the name, enter the name of the specimen shape
3, the local name, local name for the shape of the input samples, which were named in different languages, so that the translation in different languages;
4, parameters ; choose parameters to form a specimen shape; click the button ... in the upper right corner of parameter table, to display report list option's form, as shown in Figure 7-3; If you want to remove a parameter, has been selected on the left Click to remove

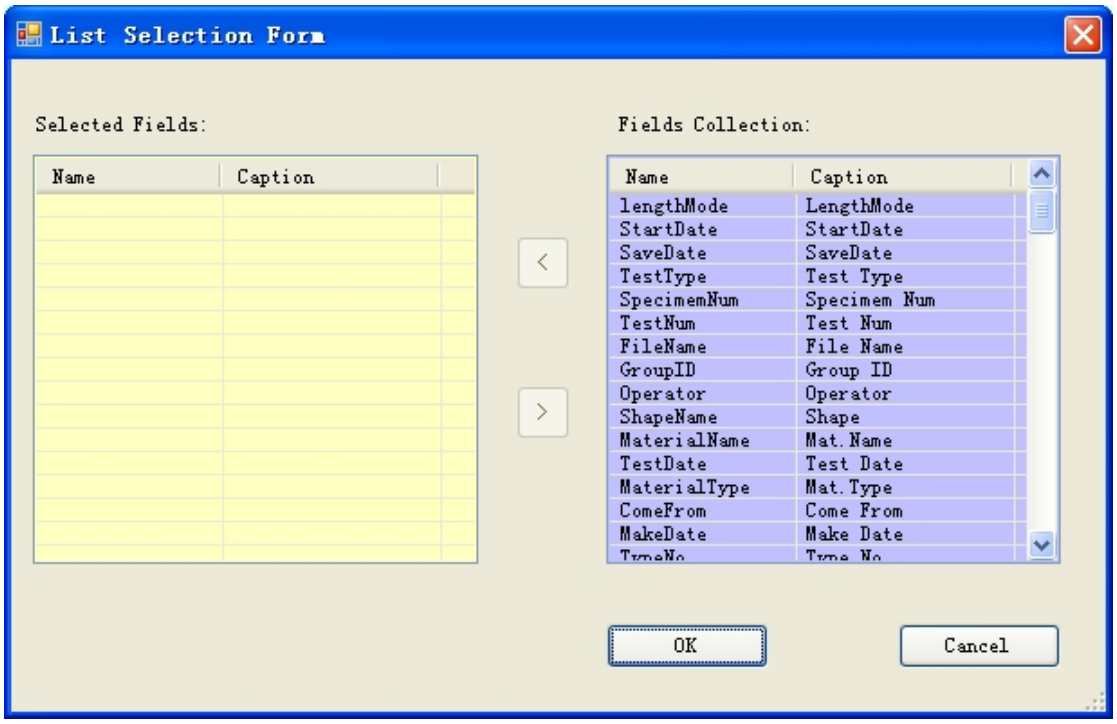


Figure 7--3

parameter name, press the button >; if you want to add a parameter, click on the right candidate to join a collection of parameter name, press the button <; finished, press the OK button OK, if you choose to cancel press the cancel button Cancel.
5, the picture; choose to form a specimen shape image; click the button in the upper right corner of parameters table ..., to display the dialog box to open image files; open a BMP format image file.

6, all finished, press the Apply button, if you choose cancel button to press cancel button.

C, the specimen shape editing

1, select a shape in the specimen shape list, click the edit button 

, the parameter list and picture be editable, name and local name can not be edited;

2, the parameter list; choose parameters to form a specimen shape; click the button 

in the upper right corner of parameter list to enter the list form of parameters, as shown in Figure 7-3; If you want to remove a parameter, if you want to remove some parameters select on the left parameter list press the button 

; if you want to add a parameter, click the right candidate to join a collection of parameter name, press the button 

; finished, press the OK button 

, if you choose to cancel press the cancel button 

.

3 pictures; choose to a specimen shape image; click the button 

in the upper right corner of parameters list to display the dialog box to open image files; open a BMP format image file.

4 Press the Apply button after all, if you choose cancel button to cancel .

D, delete the specimen shape

1, in the shape list of shape form select a shape, click the button 

, pop-up confirmation dialog; Select "Yes" to delete this sample, "No" to abandon the deletion.

Chapter 8 database field management tools

Test data stored in data files, data files using MS Access2003 format, acquired raw data stored in the TestData table, the data field is fixed and can not be modified; input or calculation results stored in the Report table, the data table You can add fields, add fields to database fields using the management tools to manage, because there are unit conversion and text translation.

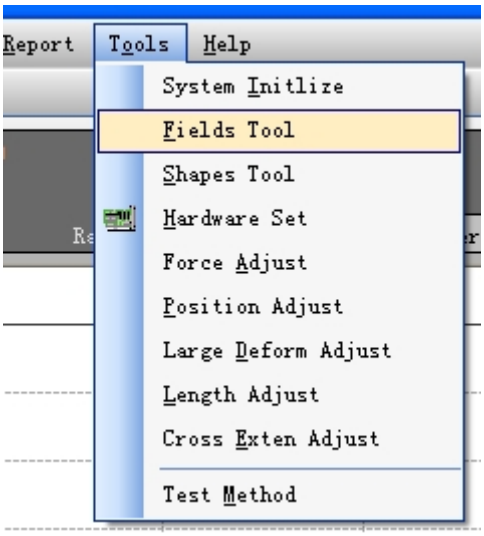


Figure 8-1

Note: The system initialization settings must have administrative privileges or the producers permission to log in the login form set function to initialize the system works!

A ,enter the database management

Run the test program into the login form, as shown in Figure 6-1;

1 Select the User ID, enter a password, click Login button to display the "management privilege" text;

2 Select a test standard, press the OK button to enter the main form;

3 in the main menu click on Tools, Options form, shown in Figure 8-1;

4 Click the database fields into the database field tool Tool Options form, shown in Figure 8-2

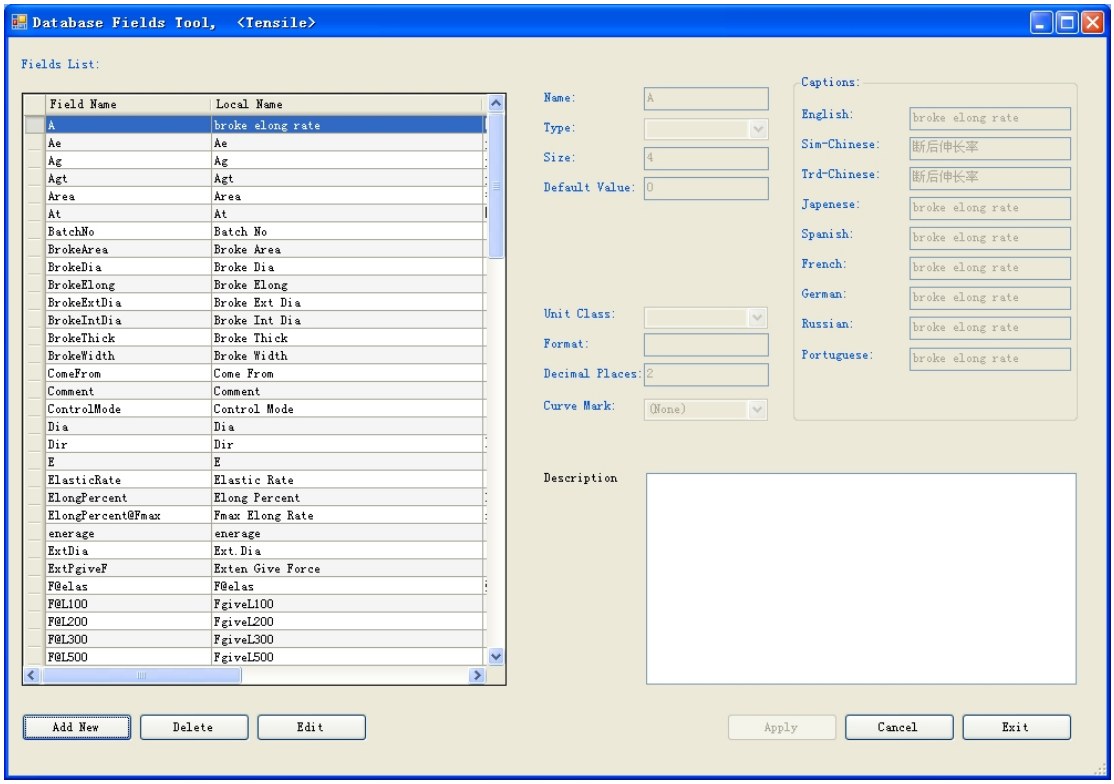
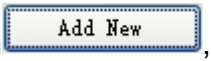


Figure 8--2

Test class include: tension, compression, bending, shearing, tearing, peeling,

Database field types correspond with the test class, the login form login selected test class, if you want to build and test the field type does not match, please return to the login form to re-selected.

B, create database field

1, click the button 

, input box allows for input;

2, the name, enter the name of the field, constitute from letter, number, underline;

3, display name, according to the different languages so that to the translate in different languages;

4, type, drop-down selection, there are five types: float, text, integer, Boolean, date and time.

5, length; type of text to be input length;

6, the default value; the field's default value;

7, the unit type; type of floating-point unit types needed;

8, format; output data format;

9, the number of decimal places; retained digit after the decimal point;

10, all finished, press the Apply button, if you choose cancel button to cancel.

C, edit database field

1, in the field list select a field, click the button 

, input box allows to input;

2, display name, according to the different languages so that to the translate in different languages;
3, the default value; the field's default value;
4, the unit type; type of floating-point unit types needed;
5, format; output data format;
6, the number of decimal places; retained digit after the decimal point;
7, all finished, press the Apply button, if you choose cancel button to cancel.

D, delete database field

1, in the field list select a field, click the button 

, pop-up confirmation dialog;
Select "Yes" to delete this field, "No" to abandon the deletion.

Chapter 9 database prototype structure

M221 software system can create more than 10000 test method, but each test method is only one of six test classes: tension, compression, bending, shear, tear, peel; each test type has its own database field and automatically calculated program. common name for Automatic calculation program of test type as follows:

test class	Automatic calculation program
Tension	TL.VBS
Compression	TY.VBS
Bending	TW.VBS
Cut	TJ.VBS
Tear	TS.VBS
Peel	TB.VBS

Into program running it will create a database file "Testing.MDB", the automatic calculated program operating the file "Testing.MDB" , M221 database management program changes it; but can only modify the prototype of the database; user can modify database with database management tool in main program and can only modify the table "Report" of database. to provide database management program; change is the report form can only be non-essential field operations.
The prototype has two tables: report and testdata table; the following we describe the structure of the prototype database in tension, similar to other types of tests:

1 prototype structure (in TL.MDB as example):

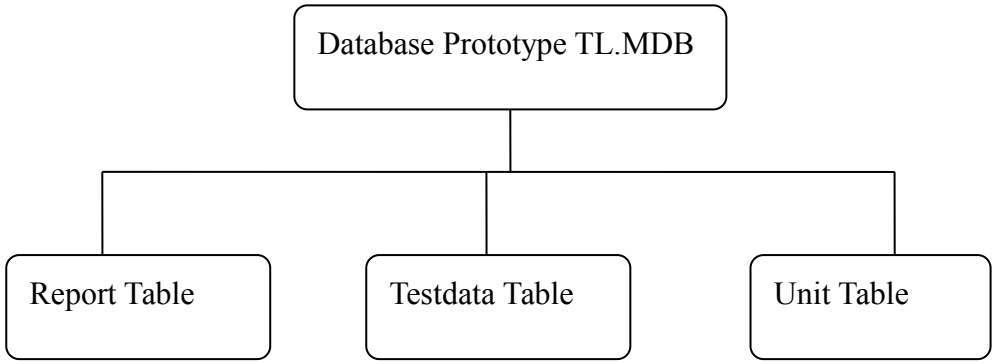


Figure 9-1

2. Testdata table; store acquired measurement datas; has seven fields:

Name	Description	Type
Num	sample number	integer
force	force value	single-precision float
lenth	deformation value	single-precision float
time	time value	single-precision float
position	location (optical encoder)	single-precision float
smallLength	small deformation (strain gauge)	single-precision float
bigLength	large deformation (optical encoder)	single-precision float

Measurement datas for each sample have thousands of lines.

3. Unit table; store the user selected the units corresponding to each unit of unit symbols, easy to convert units of output; have more than 21 fields, all fields are text type; record of only one row fixed.

Field name	The type of unit	common unit symbol
0	none	
1	Force unit	N
2	length unit	mm
3	time unit	S
4	area unit	mm2
5	area stress unit	MPa <N/mm2>
6	line stress unit	N/mm
7	strain unit	%

8	energy unit	J
9	temperature unit	℃
10	humidity unit	%
11	speed unit	mm/min
12	volume unit	mm3
13	Energy density unit	J/mm3
14	Density unit	g/mm3
15	Inertia unit	mm4
16		
17		
18		
19		
20		

4. Report form; store user input data and calculation results; generally have more than 80 fields; the following fields are required:

Field Name	Type	English display name	Chinese display name	unit class
lengthMode	Text	lengthMode	变形方式	
StartDate	Date	StartDate	开始时间	
SaveDate	Date	SaveDate	SaveDate	
TestType	Text	TestType	试验类型	
SpecimemNum	Text	SpecimemNum	编号	
TestNum	Integer	TestNum	试样号	
FileName	Text	File Name	文件名	
GroupID	Integer	Group ID	组号	
Operator	Text	Operator	试验员	
ShapeName	Text	Shape	形状	
MaterialName	Text	Mat.Name	材料名称	
TestDate	Text	Test Date	试验日期	
MaterialType	Text	Mat. Type	材料类型	
ComeFrom	Text	Come From	材料来源	
MakeDate	Text	Make Date	生产日期	
TypeNo	Text	Type No	规格型号	
TestFor	Text	Test For	送检单位	
TimeUsed	Float	Time Used	试验耗时	
BatchNo	Text	BatchNo	批号	
TestStandard	Text	Test Standard	试验标准	

Temp	Float Temp	试验温度	Temperature
Comment	Text Comment	备注	
Direction	Text Direction	方向	
Humi	Float Humi	湿度	Humidity
Speed	Float Speed	速度	Speed
Lo	Float Lo	标距	Length
Width	Float Width	宽度	Length
Thick	Float Thick	厚度	Length
Dia	Float Dia	直径	Length
ExtDia	Float Ext.Dia	外径	Length
IntDia	Float Int.Dia	内径	Length
Area	Float Area	面积	Area
Ls	Float Ls	跨距	Length
Length	Float Length	长度	Length
Height	Float Height	高度	Length
BrokeArea	Float Broke Area	断后截面	Area
BrokeElong	Float Broke Elong	断后伸长	Length
BrokeThick	Float Broke Thick	断后厚度	Length
BrokeWidth	Float Broke Width	断后宽度	Length
BrokeDia	Float Broke Dia	断后直径	Length
BrokeIntDia	Float Broke Int Dia	断后内径	Length
BrokeExtDia	Float Broke Ext Dia	断后外径	Length
Fmax	Float Fmax	最大力	Force
L@Fmax	Float Len At Fmax	最大力变形	Length
Lbreak	Float Lbreak	断裂伸长	Length
Fbreak	Float Fbreak	断裂力	Force
ElasticRate	Float ElasticRate	弹性比率	
Lmax	Float Lmax	最大变形	Length
FgiveL100	Float FgiveL100	定伸 100 力	Force
FgiveL200	Float FgiveL200	定伸 200 力	Force
FgiveL300	Float FgiveL300	定伸 300 力	Force
FgiveL500	Float FgiveL500	定伸 500 力	Force
Fgive	Float Fgive	定力	Force
LgiveF	Float Len Give Force	定力伸长	Length
Lgive	Float Lgive	定伸	Length
LenAtgiveF	Float Len At give F	定力伸长	Length
A	Float Elong Percent	延伸率	elongation
Fp0d2	Float Fp0.2	Fp0.2	Force
Rm	Float Rm	Rm（最大强度）	stress
Rp0d2	Float Rp0.2	Rp0.2(非比例 0.2%强度)	stress

Rp1	Float Rp1	Rp1(非比例 1%强度)	stress
Rp0d5	Float Rp0.5	Rp0.5(非比例 0.5%强度)	stress
Rp0d1	Float Rp0.1	Rp0.1(非比例 0.1%强度)	stress
Rp0d01	Float Rp0.01	Rp0.01(非比例 0.01%强度)	stress
ReL	Float ReL	ReL(下屈服点强度)	stress
ElasticConst	Float ElasticConst	弹性比率	
E	Float E	E(弹性模量)	stress
ReH	Float ReH	ReH(上屈服点强度)	stress
At	Float At	At ()	strain
Le	Float Le	Le (电子引伸计标距)	Length
Ag	Float Ag	Ag ()	strain
Ae	Float Ae	Ae(屈服点伸长率)	strain
Agt	Float Agt	Agt()	strain
L@FeL	Float L@FeL	下屈服点变形	Length
F@ElasLower	Float F@ElasLower	弹性段下点力	Force
FeL	Float FeL	FeL(下屈服点力)	Force
FeH	Float FeH	FeH(上屈服点力)	Force
Rt	Float Rt	Rt	stress

above field can not be changed (include name, type).
if Adding new field the type can only be integer, single, text, date, integer.

Chapter 10 automatic calculation program

Integrated within the main application to complete the most commonly used parameters are automatically calculated; extended the program for the user-editable, using VBScript. extended program naming:

test class	automatic calculation VBS
Tension	TL.VBS
Compression	TY.VBS
Bending	TW.VBS
Shear	TJ.VBS
Tear	TS.VBS
Peel	TB.VBS

VBScript is a widely used language on the Internet, a lot of information introduced about it. in this chapter describes the test program procedures for automatic calculation of main parameters of exposure to the object, and by providing examples of the programming

process.

1. how to get the main application object:

Object 1: testdata:
Corresponding to the testdata table, read-only;
Fields: num, force, lenth, time, position, smallLength, bigLength
example: a = testdata ("force"), read out force value in current record
Methods: movefirst, record pointer move to first record
movelast, record pointer move to the last record
movenext, record pointer move to next record
moveprevious, record pointer move to previous record
findfirst <condition> to find the first record by the conditions
findlast <condition> to find the last record by the conditions
findnext <condition> to find the next record by the conditions
findprevious <condition> to find the previous record by the conditions
example: testdata.movefirst
testdata.findlast "force> 100"

Object 2: report:
Corresponding to the database report table
Fields: report table all fields
example: a = report ("gauge"), read out the specimen gauge
report("Fmax") = 100, assigned 100 to the database report's "Fmax" field

Object 3: Used :
current sample's internal calculation parameters
Properties: forcemax current sample's force maximum value
lengthmax current sample's maximum deformation
timemax current sample's testing time
num current sample's sample number
positionmax current sample's biggest position
lengthAsForcemax the length at force max of current sample
forceAsLengthmax the force at length max of current sample
elasModule flexibility rate of current sample
timeAsforceMax the time at force max of current sample
Lo gauge of the sample
Object 4: MsgWindow.caption display in the main window display.

2 problems

VBS does not have VB's integreted development environment, debugging is trouble as VB, there are some errors in the main program instructions can be pointed out that the error occurred in the line, which column; but sometimes is not accurate, such as a loop of errors may indicate error occurred in the end of the loop.

Chapter 11, EXCEL report

M221 test machine control system has a strong internal reporting system; in order to enhance reporting flexibility, also embedded EXCEL2003 support to meet customers' specific needs; the EXCEL report based on the XML data and schema, the use is large To simplify, do not use VBA, drag and drop, EXCEL skilled user can create.
Make EXCEL report requirements:

Install Microsoft OFFICE 2003 Professional Edition / Enterprise / Ultimate

EXCEL report produced by the steps:

1, using EXCEL open the the template file Usertemp.xlt in test software folder , in Figure 11.1

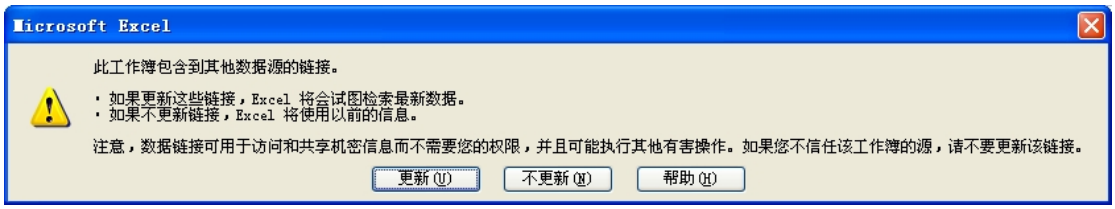


Figure 11.1

2, CLICK "not Update", enter the figure 11.2

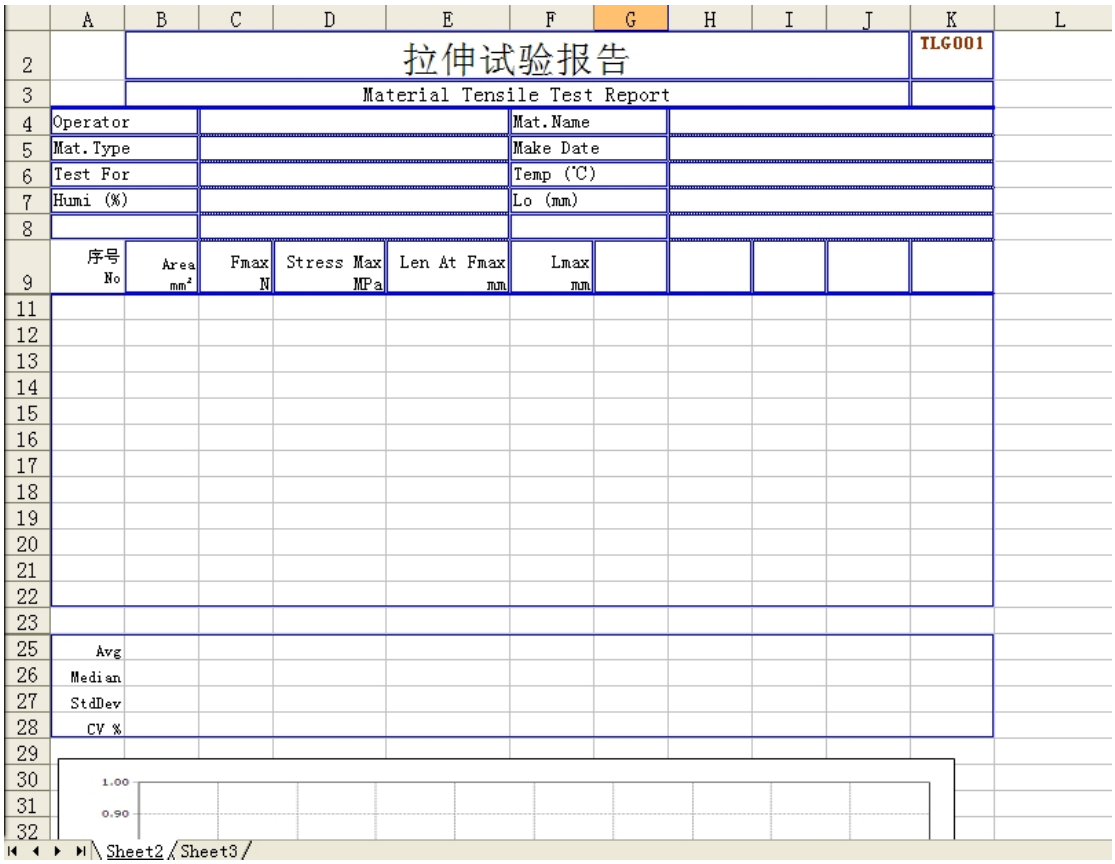


Figure 11.2

3, click the EXCEL menu Data(D) \ XML (X) \ XML source (X), enter Figure 11.3, note that the right of the XML source, we can just drag and drop a item to a worksheet cell to make report; in XML source, "reportDataSet1_ mapping" maps the data structure from test machine in tree structure: the top is the root repotDataSet1 database; the middle of three elements: DetailVal, ReportTitle, DetailResult is table of database; bottom elements are fields of these tables.

DetailVal has 14 fields:

num Val1 Val2 Val3 Val4 Val5 Val6 Val7 Val8 Val9 Val10 Val11 Val12 Group

mapping The report details result's serial number , 12 output datas , group number.

this table can have maximum 1000 lines datas. drag the Element onto a sheet cell, the cell displays the datas according to number of rows of test specimens: one line for each data sample.

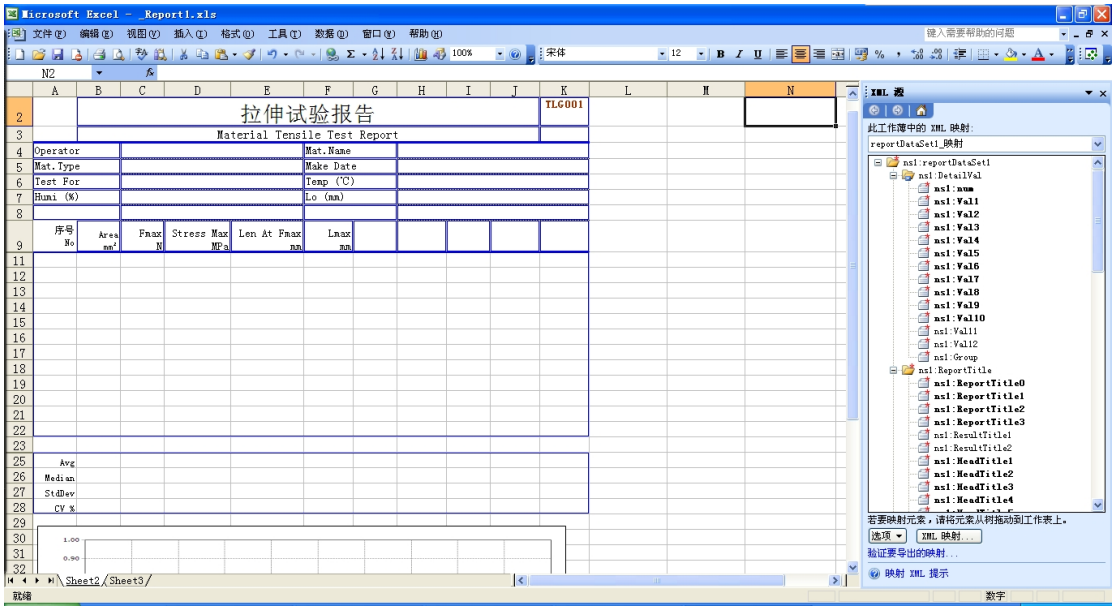


Figure 11.3

ReportTitle has more than 50 fields:
Mapping report database's miscellaneous items:

ReportTitle0	Main Title
ReportTitle1	subtitle
ReportTitle2	number label
ReportTitle3	auxiliary title
HeadTitle1 - HeadTitle12	report header title
HeadVal1 - HeadVal12	report the first data

DetailTitle1 - DetailTitle12 details of the title, corresponds to the DetailVal table Val1 - Val12
This table is only 1 row.

DetailResult has 11 fields:
AggregateName Val1 Val2 Val3 Val4 Val5 Val6 Val7 Val8 Val9 Val10
mapping the summary name, 10 summary datas.This table up to 7 lines.

4, Logo icon insert as a picture;

5, test curve chart as OLE objects insert into report:
Method: Click on the menu insertion (I) \ object (O), shown in Figure 11.4

Figure 11.4

Choose "create by file" page, and then select "Create from File", as shown in Figure 11.5

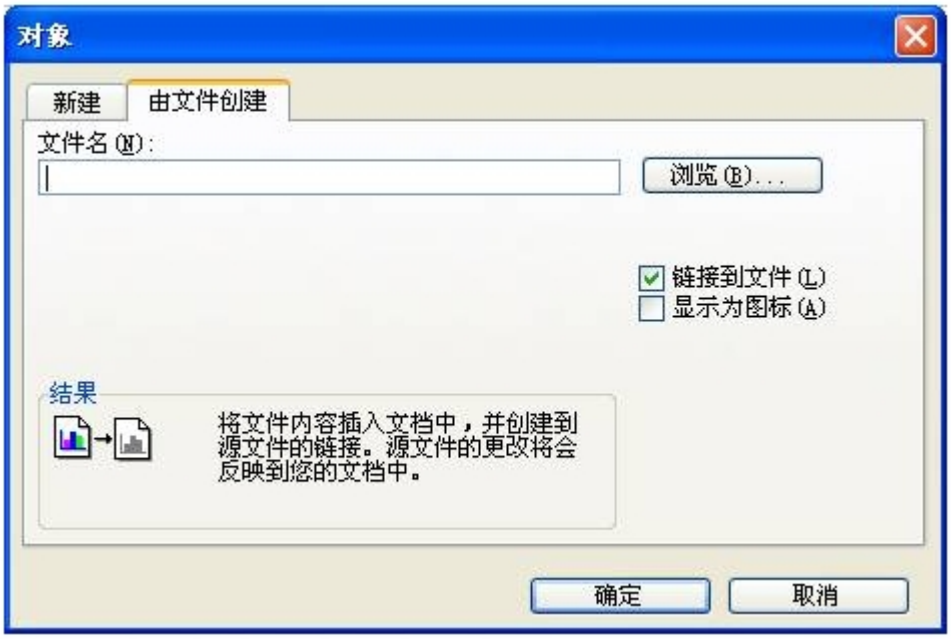


Figure 11.5

Click "Browse" to select D: \ anyTest \ Curve.bmp; click "OK" after the picture frame, according to the need to adjust the position and size.

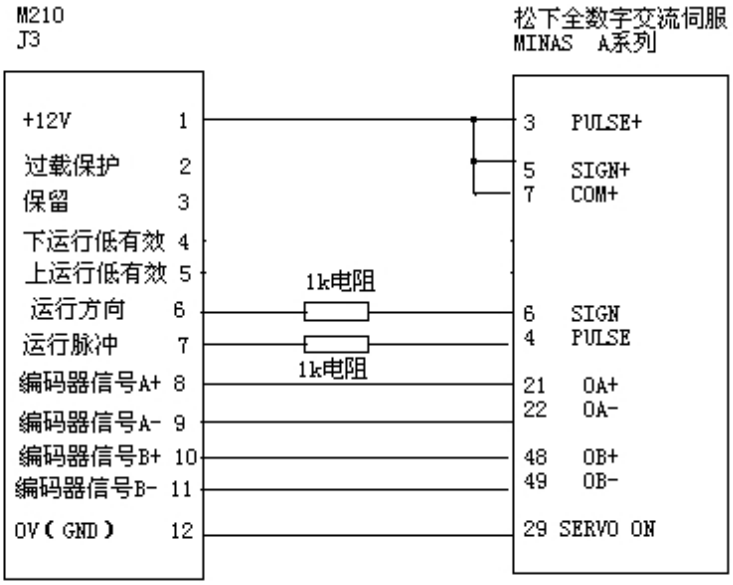
6, Note:

a) Drag and drop elements (fields) in DetailVal table and DetailResult table will be displayed text values as "ns1: Val1", set the cell's format with menu: format\cell\align\auto wrap, and then hide the cell;

b) merging cells must be before drag and drop elements into cell.after deleting cell's

element must merge cells again.

Appendix A: M221 and the Panasonic digital AC servo drive connection reference



M221 digital AC servo drive

Figure A-1

Parameter settings:

1) control: position; (* Pr0.01 = 0)

2) The pulse output frequency 50; (* Pr0.11)

3) The pulse output logic is inverted, such as displacement contrast, the B-phase contrast; (* Pr0.12)

4) Command pulse points / octave press 5000/5000, and then adjusted according to circumstances; (* Pr0.08=0) (* Pr0.09) (* Pr0.1)

5) Command pulse input 0: optical coupling circuit input (* P0.05 = 0)

6)to take anti-logic pulse command needed; (* Pr0.06 = 0 or 1)

7) command pulse input pulse train + sign. (* Pr0.07 = 3)

8) Other basic parameters set by default;

9) parameter settings and save, shut down and restart the computer.

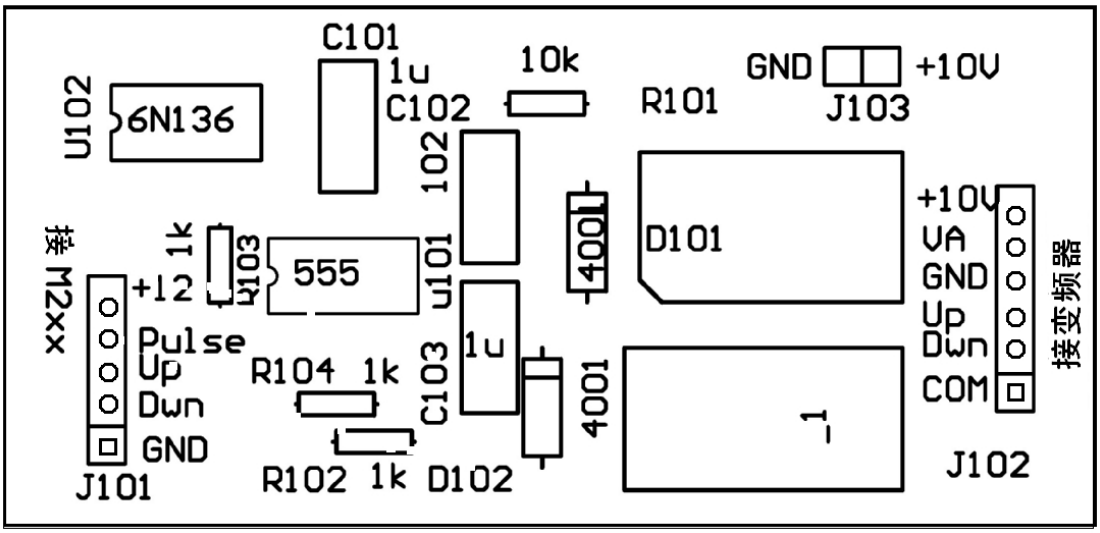
10) The above wiring diagram and parameter settings for reference only, actual wiring manual execution should be governor.

Note: * Pxx as Matsushita (Panasonic) AC servo motor driver MINAS A5series of parameter number.

Appendix B: FV converter shows a small improvement board:

Increase of optical isolation, between the governor and M221 reduced interference and increase reliability.

Still presented to the user needs, we are not in production testing, if the problem can be replaced.



FV transform a small wiring board:

J101 and M221 J3 J102 and inverter

2 ---------- 4 1 --------- Reversible switching signal common

3 ---------- 5 2 --------- reverse switch signal

4 ---------- 7 3 --------- forward switching signal

5 ---------- 1 (+12 V) 4 --------- speed analog voltage signal to

5 --------- speed analog voltage signal

6 --------- speed analog voltage power supply