

Universal Testing Machines

Electromechanical Testing Machines TESTCOM Series

 Force: 5 - 100 kN



Since 1970
Made in Spain (EU)

www.ibertest.com



Introduction

New design of bench electromechanical universal testing machines manufactured by IBERTEST, as evolution of low load ELIB machines.

State of the art testing specifications combined with a modern look and ergonomic design.

Electrical servomotor driven, maintenance-free, for precise, quiet and smooth work.

MODEL	MAX. FORCE
TESTCOM-5 TESTCOM-5/E	5 kN
TESTCOM-10 TESTCOM-10/E	10 kN
TESTCOM-20 TESTCOM-20/E	20 kN
TESTCOM-30	30 kN
TESTCOM-50	50 kN
TESTCOM-100	100 kN

Note: /E version means extra height

If you need more force capacity machines, please consult the IBERTEST machines

EUROTEST Series (up to 2000 kN)

NEW: ALL in One touch PC interface

New user-friendly interface, with embedded touch screen PC, with modern and improved performances.

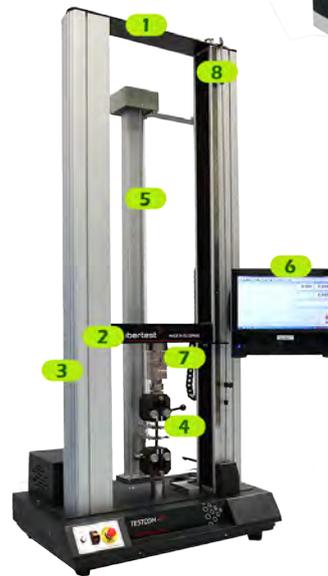


A reliable alternative to conventional table top PC's, combining a CPU compact design with TFT touch-screen, with all the performances of traditional desktop PC systems.

The PC "All in One" saves in laboratory space and offers the user an ergonomic position to work, both with WinTest32 software as with testing fixtures.



TESTCOM-30
TESTCOM-50
TESTCOM-100



TESTCOM-5
TESTCOM-10
TESTCOM-20

Parts identification

1. Fixed upper crosshead: to provide test frame stiffness
2. Mobile crosshead: actioned by the screw drivers. Applies the load against the test specimen.
3. Frame housing: to host and protect screw drivers and guiding columns
4. Gripping heads. Other gripping heads and testing fixtures are available
5. Long travel extensometer. Designed for high elongation materials.
6. Touch-screen interface, via WinTest32 testing software, pre-installed in a All in One computer,
7. Load cell. Universal type (tensile-compression)
8. High precision transducer for measure of the crosshead position. mounted on the ball-screw axis.

Main frame

Defined for carrying out all type of static material strength testing, according to EN, ASTM and analogue standards.

With additional devices, compression, bending, folding, shear, punch, extrusion, etc tests can be performed over a large amount of materials and samples dimensions.

High and low temperature tests can be carried out using thermal chambers, ovens, cooling systems, etc. a along with its special testing fixtures.

Machine base hosts the lower crosshead, the servomotor as well as the screw-ball driven mechanical transmission system.

Two guiding columns (chrome coating) and two high precision ball-screw drivers, assures an optimum load share and optimal linear mobile crosshead displacement.

Upper crosshead designed for frame stabilization and stiffness. On demand it can be designed to allow a secondary testing frame over the mobile crosshead.

End of stroke detectors (adjustable) and visual positioning ruler placed along the frame.

Displacement measurement

By means of a encoder placed on the screw-ball driver axis

- › Resolution: 0.001 mm or 0.005 mm, depending on model.
- › Speeds: 0.001 up to 1000.00 mm/min, depending on model. Other speeds are possible on demand

The data obtained in the encoder is used for two applications: test results and to send feedback to the close loop control (MD series system).

Load measurement

Universal strain gauge load cell (tension compression), high precision and repeatability. Same capacity as the maximum load of the testing frame.

High quality of the load cell, guarantees Class 0,5 according to ISO 7500-1 within the measuring range (1 to 100% of the nominal capacity).



Double function: to measure the force applied on the specimen (kN) and to provide feedback for the closed-loop control (MD system) .

Additional load cells can be installed to increase the low measuring range or for special applications.

Self recognition system for load cells. Allows control to get auto configured according to the capacity and calibration of the load cell mounted. Time effective and safety improving (avoiding overloads).



Compression test with square platens. IBERTEST supplies also circular and rectangular compression platens for fitting whatever testing requirement.



Single load bending/ flexural testing fixture. Two-points load can be applied with a double load roller bending/flexural fixture



Tensile testing with a long travel extensometer. Allowing to determine elastic yield point and deformation till breaking.

Electromechanical Testing Machines - TESTCOM Series

TECHNICAL SPECIFICATIONS

MODEL	TESTCOM-5 TESTCOM-5/E	TESTCOM-10 TESTCOM-10/E	TESTCOM-20 TESTCOM-20/E
Máximum load	5 kN	10 kN	20 kN
Force measurement	Universal (tensile-compression) extensometric-bands load cell Additional load cells can be installed		
Measuring Range	1 % to 100 % of the load cell nominal capacity		
	50 - 5.000 N	100 - 10.000 N	200 - 20.000 N
Precision: class according ISO 7500	0,5	0,5	0,5
Force resolution	0,1 N*		
Columns	2 grounded columns, chrome-plated steel		
Ball screws	2 high precision ball screw, with scrapers		
Mobile crosshead	Driven by the ball screws, guided by the 2 columns End of stroke with proximity detectors Automatic return to start test position, defined via WinTes32 software.		
Motor drive	Synchronous servomotor (Brushless) with direct drive to screws by reducers. Enables displacement and load closed loop control (servocontrol)		
Gear transmission	Motor-pulley and reducer-pulley connecting via HTD precision teeth belt. Adjustable belt-tightening system		
Movement speed range (mm/min)	0,01 - 1000,00	0,01 - 1000,00	0,01 - 1000,00
Load speed range (kN/s)	Between 1% and 10% of maximum load capacity (others on demand)		
	0,0005 - 0,5 kN/s	0,001 - 1 kN/s	0,002 - 2 kN/s
Crosshead position measurement	Encoder		
Crosshead position resolution	Resolution 0,005 mm 1 micron is possible (on demand)		
Power supply	Single-phase 220V + earth, 50/60 Hz		
Power consumption	1400 W	1400 W	1400 W
Vertical free light with load cell, without fixtures	700 mm 1200 mm E version	700 mm 1200 mm E version	700 mm 1200 mm E version
Horizontal free distance	425 mm	425 mm	425 mm
Dimensions (mm)	720 x 510 x 1320**(h) ** 1720 mm E version	720 x 510 x 1320**(h) ** 1720 mm E version	720 x 510 x 1320**(h) ** 1720 mm E version
Approx. weight without testing fixtures	120 kg 140 kg E version	120 kg 140 kg E version	120 kg 140 kg E version
Safety	Emergency push-button, located in the front of the machine		

IBERTEST reserves the right to modify the described characteristics without prior notice.

* Note: 5 digits with floating point.

TECHNICAL SPECIFICATIONS

MODEL	TESTCOM-30	TESTCOM-50	TESTCOM-100
Máximum load	30 kN	50 kN	100 kN
Force measurement	Universal (tensile-compression) extensometric-bands load cell Additional load cells can be installed		
Measuring Range	1 % to 100 % of the load cell nominal capacity		
	300 - 30.000 N	500 - 50.000 N	1.000 - 100.000 N
Precision: class according ISO 7500	0,5	0,5	0,5
Force resolution	0,1 N*		
Columns	2 grounded columns, chrome-plated steel		
Ball screws	2 high precision ball screw, with scrapers		
Mobile crosshead	Driven by the ball screws, guided by the 2 columns End of stroke with proximity detectors Automatic return to start test position, defined via WinTes32 software.		
Motor drive	Synchronous servomotor (Brushless) with direct drive to screws by reducers. Enables displacement and load closed loop control (servocontrol)		
Gear transmission	Motor-pulley and reducer-pulley connecting via HTD precision teeth belt. Adjustable belt-tightening system		
Movement speed range (mm/min)	0,5 - 500,00 (up to 250 mm at max. load)	0,001 - 500,00 (up to 250 mm at max. load)	0,001 - 500,00 (up to 250 mm at max. load)
Load speed range (kN/s)	Between 1% and 10% of maximum load capacity (others on demand)		
	0,003 - 3 kN/s	0,005 - 5 kN/s	0,01 - 10 kN/s
Crosshead position measurement	Resolver		
Crosshead position resolution	Resolution 0,001 mm		
Power supply	Single-phase 220V + earth, 50/60 Hz		
Power consumption	2000 W	500 W	750 W
Vertical free light with load cell, without fixtures	1100 mm	1100 mm	1300 mm
Horizontal free distance	450 mm	450 mm	450 mm
Dimensions (mm)	1930 x 880 x 580 mm	1800 x 900 x 685 mm	2015 x 900 x 705 mm
Approx. weight without testing fixtures	360 kg	375 kg	525 kg
Safety	Emergency push-button, located in the front of the machine		

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ELECTRONIC DIGITAL MODULES

CONTROL SYSTEMS

MD CONTROL UNITS . MODULAR SYSTEM

Electronic controller units MD are specially designed for data acquisition and close loop control of testing instruments.

Measuring transducers are plugged to the MD module and the measurement is exported to the computer via USB or Ethernet.

The IBERTEST software WinTest32 makes data collection and shows real-time for drawing graphs and test results calculation.

This new system, based in external modules, substitutes the old electronic cards mounted into the computer, improving the performance, reliability and data acquisition speed.

Due to the external module configuration, the computer can be fast and easily changed by any other suitable PC or laptop, without need to make adjustments or calibrations.

This is very useful in case of eventual breakdown of the computer, or when obsolete computer needs to be changed.

MD2 MODULAR CONTROL UNIT, FOR STATIC TESTS

MD2 unit has been designed for **static** machines. The MD2 can be used either in electromechanical or servohydraulic machines.

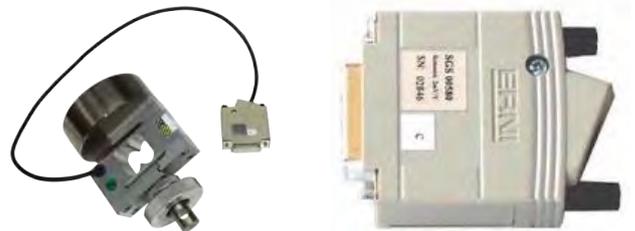
The MD2 unit has the following input channels:

- Load channel. With a resolution of ± 180.000 steps. For the connection of a load cell or pressure transducer.
- X-Head position channel. For connecting a digital incremental position transducer (encoder) or a resolver (encoder emulator) or position transducers (SSI, draw wire linear transducers, etc.)
- 2 Bus extension slots for data acquisition cards "plug-in" type, for connection of further load cells, extensometers, LVDTs, position transducers, etc.

The MD2 unit comprises an analogical $\pm 10V$ drive channel for a servovalve (hydraulic machines) or a servo-motor (electromechanical machines).

MD2 features a high quality build-in electrical safety box, dustproof, ensuring the perfect state of the internal electronics.

This compact box allows to integrate the module within the frame of the machine itself (TESTCOM model) or within the electric panel of the machine (machines EUROTEST, IBMT4, UMIB, IBMU4).



The transducers comprises connector-plugs with built-chip EEPROM memory.

The transducer calibration data (unit of measure, range, zero position, linearization, etc.) are stored in the EEPROM memory. Thus, the transducer is automatically recognized as input channel when plugged to the by MD

PID CONTROL

The MD module uses PID (proportional-integral-derivative) for control loop feedback of the application of force to the test specimen.

The PID controller calculates an error value as the difference between the measured process variable (force, position or strain) and the desired setpoint.

The three signals coming from the PID are combined to generate a new command signal, which is sent to the servovalve or servomotor to eliminate the deviation as fast as possible and assuring the stability of the process.

The process of detection, evaluation and new signal generation is repeated again and again. The time consumed is the **closed loop control** time and the lower the time, the faster the controller.

3 CONTROL OPTIONS

MD electronics allows to close the control loop with the applied load (control in kN/s) or with the position (control in mm/s) or with the material deformation (control in mm/s):

1. Load control

The MD module receives the signal from the load cell and compares this feedback value with the command value (N/s or kN/s).

2. Position control

The MD module receives the signal from machine's position transducer (encoder, resolver, LVDT, etc.) and compares this feedback value with the command value (mm/min).

3. Strain control

The MD module receives the signal from machine's deformation transducer (extensometer) and compares this feedback value with the command value (mm/s or mm/min)

APPLICATIONS OF EACH TYPE OF CONTROL

Load control is normally used on low load resistance tests materials which undergo deformation just before fracture, such as concrete, cement, ceramics, rocks, adhesives, etc. as well as in metals test on material elastic zone.

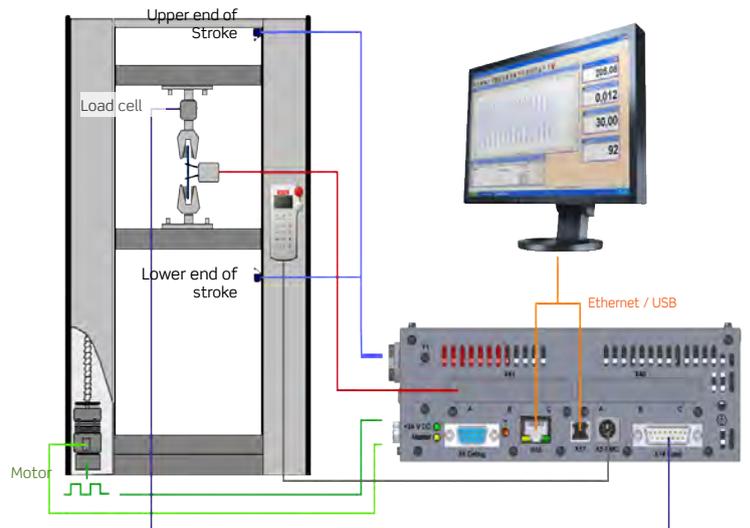
Position control is used in materials with high deformation, as rubers, elastomers, etc as well as on metals after elastic range.

Strain control is used in fracture tests and for research applications.

AUTOMATIC AND PROGRAMMABLE CONTROL CHANGE.

The IBERTEST WinTest32 testing software allows to define several criteria for changing control automatically (defined variation in the slope of the graphic, certain value of strength, load, position or deformation).

This feature is used in several applications as in metals testing, to allow the control change among behaviour regions of the material (change from elastic to plastic behaviour)



Scheme of load control for electromechanical testing machines



Built-in MD2 module in a Testcom machine



Remote control unit UCRD-6 (Optional)

Electronic digital modules MD

Specifications of MD2 and MD22 modules, for static and dynamic tests

MODULE	MD2	MD22
Front View		
Rear View		
Application purposes	Static tests	
Microprocessor	CPU 800 MHz	
Channels	Up to 4	
Resolution	± 180.000 steps per channel	
Max sampling frequency	1 kHz 1000 reading per sec per channel	
Sincronization	All channels fully synchronous and simultaneous	
Closing loop time	1 milisecond (1000 times per second)	
Drive interface	$\pm 10V$ -Command-Output (generated with ± 15 Bit resolution) I/O's and relays for safety functions	
Expansion possibilities	Up to 8 modules can be connected. 32 total synchronous channels	
PC communication	USB 2.0 full speed and/or Ethernet 10 / 100 Mbit	
Digital Inputs (24 V)	8	
Digital outputs (24 V)	8	
Serial sensor interface	COM1 (internal)	
Debug interface	COM2: 115 kB	
Slot for safety shield	YES	
Power supply	DC 24 V	
Remote control option	YES	NO

Specifications of MD5 and MD58 modules, for static and dynamic tests

MODULE	MD5	MD58
Front View		
Rear View		
Application purposes	Static and Dynamic Tests	
Microprocessor	CPU 800 MHz Control: DSP 32 bit	
Channels	Up to 8	
Resolution	± 256.000 steps per channel	
Max sampling frequency	5 kHz 5000 reading per sec per channel	
Sincronization	All channels fully synchronous and simultaneous	
Closing loop time	0,2 milisecond (5000 times per second)	
Drive interface	±10V-Command-Output (generated with ±15 Bit resolution) I/O's and relays for safety functions	
Expansion possibilities	Up to 32 modules can be connected. 256 total synchronous channels	
PC communication	USB 2.0 full speed and/or Ethernet 10 / 100 Mbit	
Digital Inputs (24 V)	8	
Digital outputs (24 V)	8	
Serial sensor interface	COM1 (internal)	
Debug interface	COM2: 115 kB	
Slot for safety shield	YES	
Power supply	AC 100 – 250 V	
Remote control option	YES	NO

HAND-HELD REMOTE UNIT

UCRD-6

Features

1. Operation via function keys and digital control pad *DIGIPOTI*, for scrolling, data input and menu navigation.
 2. OLED graphics display 128 x 64 dots.
 3. Dimensions: L 25 x W 65 x H 202 mm
- Keys UP/DOWN /STOP for crosshead or actuator movement. More accurate movements are possible using the digital control pad *DIGIPOTI*.
4. Selection of operation mode: via remote control unit or via software.
 5. The UCRD-6 has a magnetic back and therefore can be placed at an ergonomic position.

Advanced features

The UCRD-6 unit can perform several simple predefined tests without need of a computer or additional software:

- › Tensile of metallic materials
- › General tension/compression test
- › Bending
- › Tear test for elastomeres
- › Brazilian concrete test
- › Cycles

Test configuration

- › Pre-load value and speed to reach preload
- › Maximum stress speed within elastic range.
- › Maximum extension speed within yield range.

Sample definition

- › Thickness, width, diameter, initial section (S_0), gauge length (l_0), parallel length (l_c)

Available type of control

- › Load - Position
- › Load-Extension-Position (only with extensometer)
- › Control mode change during testing

The UCRD-6 can detect end of elastic range, end of yield and breakage, with the following criteria:

- › Defined values: Mpa, kN/mm², kN, N
- › Relative drop in relation to F_m : %
- › Absolute drop: N, kN



WINTEST32 SOFTWARE

FOR MATERIALS TESTING

Introduction

32-bit software pack, running under Windows™, specially developed by IBERTEST to be used in universal testing machines.

Thanks to its flexibility and power, you can easily customize software WinTest32, to every need.

Indeed, the system allows user to configure tests according to the major international standards for engineering materials (UNE, ASTM, ISO, ... etc). However, for a small supplement, IBERTEST can adapt WinTest32 software to special needs or for your laboratory.

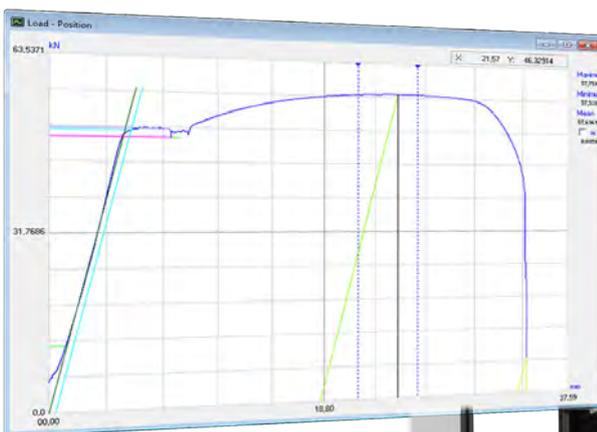
During design phase of WinTest32 software, IBERTEST paid special attention to the ease of use, so the program can be handled even by users with little experience in computers.

The WinTest32 control screen provides toolbar and intuitive menu for quickly identify available actions, to select and configure test parameters without consulting the manual.



The software shows the user available options and its possible settings at each time, guiding user step by step interactively through test configuration.

Thus, WinTest32 helps user to optimize processes when using materials testing machine, getting the best performance both in the execution of the test and in the results analysis.



Initial control screen



Screen of test results



Using WINTEST32 on a Tocu Screen "All in One"

2. SPECIMENS IDENTIFICATION

By means of window: "Specimen Parameters", user has multiple options to label specimens.

- › Name of test / specimen / sample, origin, batch, client, auto-numbering, date, etc.
- › Test material, geometry of the specimen (length, width, diameter), mass, density, etc..
- › Free text. For adding any important info not reflected above.

3. TEST DEVELOPMENT

The program performs tests automatically, according to the method and parameters previously introduced in the test configuration.

For test monitoring, PC screen shows, in real time, following features:

- › Graphical representation: XY charts of load-stroke, load-strain, stroke-strain, etc.
- › Instant numerical values, obtained by the sensors connected to the system (position, load, strain, etc).
- › Real-time execution and presentation, of the results of the calculations pre-programmed by the user with the integrated programmable calculator.

If something goes wrong, the user can stop the test at any time during its execution.

4. TEST RESULTS: ANALYSIS AND MANAGEMENT

Once test is completed, results and the graphical representation are shown in the screen. If user rejects the test, results won't be stored. Before validating the test, you can perform following actions:

- › Select and expand areas of the graph (zoom).
- › Change the type of XY chart.
- › Location and search for singular points of the chart.

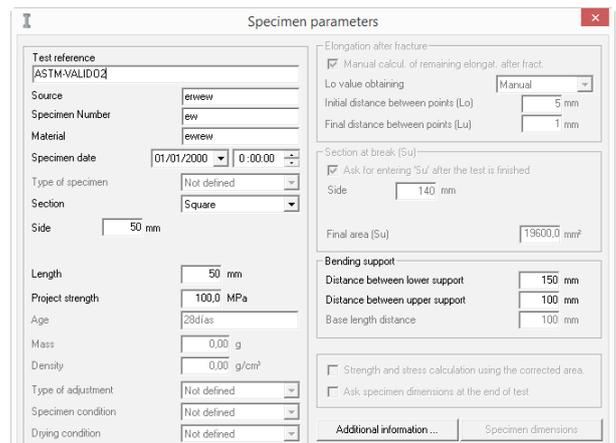
The statistical program allows you to compare several tests including consecutive superimpose curves, create 2D and 3D bar and lines diagrams, create bmp images, etc.

The output files can be converted to XML, ASCII or CSV formats to be exported to other systems such as Excel, LIMS, etc.

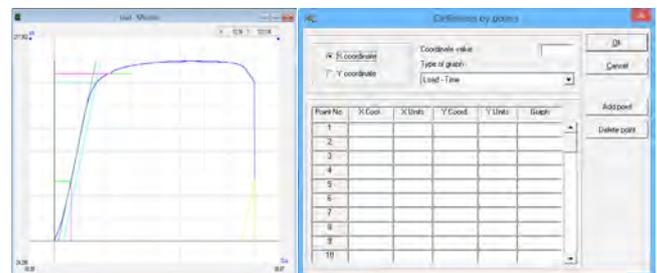
TEST SIMULATION MODULE

Additional module that allows to recover machine parameters (real tests) and reuse on other computers. Being able to simulate once again the test as if performed in real time, without the need for connection to the machine. Main characteristics:

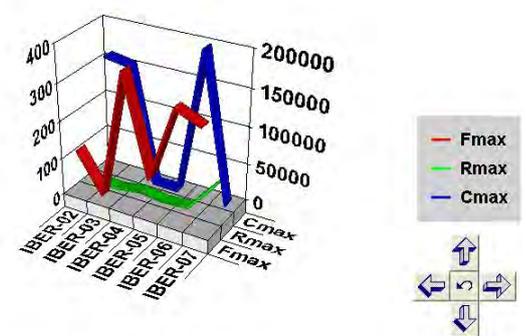
- › Test recovery from network or local
- › Real test simulation
- › Graph visualization on real time
- › Calculation of test parameters
- › Generación de informes



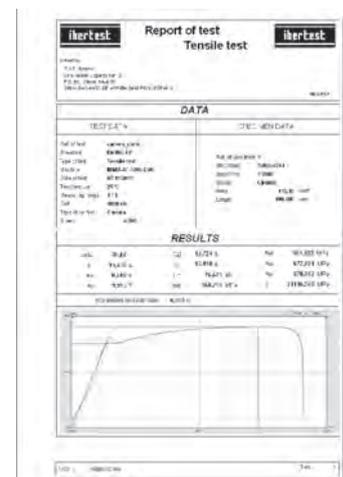
Setting parameters for the test specimen



Location of significant points on the graph of the test



Test comparison - 3D representation



Example of a test report

Main Features

Operating system	WinTest32 works with all Microsoft™ Windows® (32 and 64 bits) operating systems and shares common features with other Windows® programs (system of menus, toolbars, file management, sizing of windows, colors, etc..)
Help functions (usability).	<p>The icon toolbar can be displayed as reduced version, including only the more common features and larger icons.</p> <p>The program is compatible with touch screen computers.</p> <p>The F1 key activates the help window. Help support includes a complete user manual for each application.</p>
Type of tests	Tensile, compression, flexure (one or two load points), bending, extrusion, penetration, shear, etc., on metallic and nonmetallic materials.
Test models	<p>WinTest32 comprises test models according to most commonly used standards (EN, ASTM, ISO, etc..). The user can configurate similar test models.</p> <p>Under request, we can make modifications to configure your WinTest32 software to your special needs (consult additional cost)</p>
Cyclical testing	<p>WinTest32 allows to create cyclic tests, with rising, keeping or falling of the load applied to the specimen. The change of slope or ramp can be done in response to load, stroke or both figures inclusive.</p> <p>When necessary, the slope changes may be accompanied by the control mode (load or stroke) changes.</p>
Serial testing	<p>Possibility of grouping several tests together, in series and subseries.</p> <p>It is possible to obtain statistical information of the grouped tests parameters.</p>
Multi-frame control	Management of up to six testing zones, in alternately way, using the same PC and the same software. The software shows the available test zones to selecting.
Measurement channels	<p>Simultaneous representation of several measurement channels at once.</p> <p>WinTest can manage up to 16 channels (both deformation or auxiliars). The channels can be configured by the user. To use all features offered by WinTest32, you may need additional hardware.</p>
Calculator programming	<p>The system integrates a programmable formula calculator.</p> <p>In this way, you can combine parameters of the specimen with results or values obtained during the test, in order to obtain derivatives results (modules, strength, unit conversion, etc.) in real time.</p>
File management	Test results automatically recorded on hard disk, and the configuration of the machine at the time of their execution. These tests can be recovered for further analysis.
Data exportation	The output files can be exported in XML, ASCII or CSV and Excel format (csv or xls), allowing these files to be imported for most of the programs, word processors and spreadsheets on the market.
Statistics	<p>Incorporates the possibility of performing statistical analysis on tests previously recorded on hard disk.</p> <p>The statistics can be displayed as graphs, histograms, level with Gaussian distribution, charts, dimensional comparison (both tapes and volumes), test curves comparison by superimposing them on a diagram of coordinates, etc.</p>

"TECHNICAL SUPPORT HAS NEVER BEEN EASIER"

TELEDIAGNOSIS is a remote diagnostic service and maintenance support, available for all IBERTEST equipment and testing machines equipped with data acquisition system by computer.

The immediate attention of TELEDIAGNOSIS service for customers located worldwide, minimizes downtimes and avoids delays in the work of laboratory, while reducing or eliminating the overhead of moving the IBERTEST technicians.

To run TELEDIAGNOSIS a link program is used which establishes a remote connection to control the computer of the machine, quick and safe, ensuring IBERTEST services even at facilities with distant locations.

Thereby, an easy and effective intervention from our Technical Service is possible regardless of the location of the machine, as long as an access to INTERNET is available.

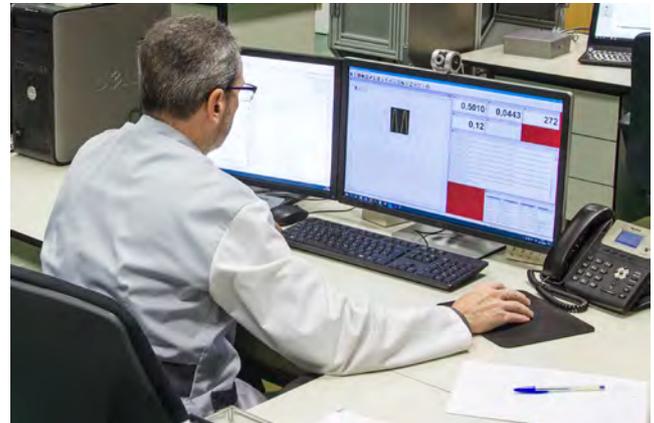
Even on those occasions when the Technical Service must act "in situ", the TELEDIAGNOSIS is helpful to clearly identify the problem in advance and improve first-visit resolution rates.

During a TELEDIAGNOSIS session, the following actions can be performed:

- › **Software revision and correction.** IBERTEST technicians can inspect the software file system, looking for wrong configurations, lost files and directories, corrupted files, viruses or others. Once the errors are detected, only the appropriate libraries and changes are transferred, without reinstalling complete programs.
- › **Remote handling.** IBERTEST technicians can operate the remote machine in real time to perform maneuvers, tests of mechanical movement, installation of testing transducers and accessories, verification of electrical and electronic systems, on/off alarm and security systems, etc.
- › **Videoconference.** Through webcam a videoconference between client and our technicians can be maintained, thus we can get visual-information about the correct operation of the machine's mechanical and hydraulic systems. Also, by written or voice messages, it is possible to exchange views and comments, and give appropriate instructions to the user, when necessary, to perform some physical action in the machine.
- › **Updates.** The software can be easily updated to its latest version, which allows enjoying the advantages resulting from the continuing work of review and program development.
- › **Factory reset.** All machines have a backup, stored in our servers in Madrid, which allows you to restore the original configurations when necessary.

TELEDIAGNOSIS

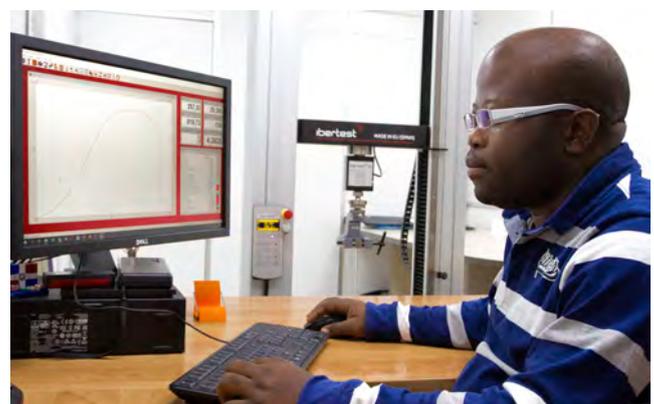
REMOTE DIAGNOSIS SERVICE



IBERTEST Spain - Madrid Technical Services



Real time TELEDIAGNOSIS link



End-user laboratory (anywhere in the world)

Remote diagnostic service by TELEDIAGNOSIS is free during the first year and during the warranty period.

After the guarantee period, many of our customers require the Annual Telediagnosis Pass, which covers interventions of up to 5 hours a year.

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