Product Information

Modernization components: *testControl* and *testXpert*® II

Zwick *testControl* – The No. 1 Electronics for Intelligent Testing Systems

***testControl* at a Glance**

***testControl* - a State-of-the-Art System**

Guaranteed Standards-Compliant Testing Even for Fast Processes
- *testControl* meets the requirements of every application at any necessary measured value acquisition and transfer rates.
- Event-controlled response and 500 Hz online processing of measured values
- Innovative transfer protocol
- High analogue resolution for high calibratable accuracy classes

The Platform for the Future
- Open standardized interfaces together with the modular system enable you to participate in each technological development – today and tomorrow
- Modular and target oriented setup, as well as numerous functions and interfaces ensure long term investment

No Effort Controlled Drive and Positioning
- Highest positioning capability and precise speed control via adaptive controller
- Rapid reaching of control targets
- Full automatic controller adaptation in real-time
- Reducing costs and time intensive pre-tests
- Highest possible reproducibility of your tests

With *testControl* Enhanced Benefits for the User
- Long-term investment security and futureproofing due to deployment of latest technologies and observance of highest quality guidelines
- Tailored configuration thanks to a modularity geared for the special requirements of materials testing machines
- Compatibility concept for a steady extension of the range of reusable components

Comfortable Handling
- No mix-up-possible EMC-compatible plugs
- Monitoring and registration of overloads for reliable calibration
- Automatic sensor recognition

testControl electronics and *testXpert*® II testing software

testControl - a Modular System
- Compilation of an individual test system
- Core system with 2 module slots, adaptive control, monitoring of safety-critical protection mechanisms
- Modules for different test data recording cards; i.e. bus expansion module for slot expansion on 4 or 10 ports
- Options, such as 500 Hz online test data transmission, the Stand Alone operation variant or remote control units tailor-made for the user

Guideline and standards applied	Examples on content
MRL: Machine Directive	
DIN EN 292/294,	Safety distances,
DIN prEN 954/953,	fixed and movable
DIN EN 418,	guards,
DIN EN 349	Emergency stop equipment
EMC: Guideline for electromagnetic compatibility	
DIN EN 50081,	Emitted interference,
DIN prEN 50082	Interference immunity,
DIN EN 55011,	Radio-interference
DIN EN 61000/-4 ff	
Low-voltage guideline: EC Low-voltage Directive	
DIN EN 60204	Electrical equipment of machines

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Modern Control and Evaluation Electronics for Fail-Safe Operations
• Intelligent sensor plugs
• Clearly set-up control panel and plausibility check

Zwick *testControl* – Independent of New PC Technologies as not Integrated in the PC
• Usage of standard PCs
• No loss of machine electronics upon PC replacement

Tasks of Measurement and Control Electronics in Test Technology
Measurement, control and regulation electronics (MCRE) take over a central role in a test system. Everything, from preparation of the physical measurement signals, for final processing via appropriate programs, via control of the test sequence up to drive system regulation, takes place entirely automatically and in real time. The increasing functionalities of modern micro-electronics allow more and more functions in a test system to be carried out directly on the electronics. This makes operation of such a system increasingly simpler.

The use of standard electronics, e.g. to SPS or PC basis, doesn't offer, amongst others, the necessary accuracies or resolutions to be able to offer a certain modular system solution.

Measurement
The target of materials testing is to determine physical properties of materials or components via single-axis or multi-axis loading. For this purpose, different sensor technologies are attached to the object to be tested. Different methods are available for this. For example, measurement of analogue voltages on strain gauges for force measurement. These signals are converted into digital signals with corresponding resolution by the electronics. Taking the example of calibrating a strain gauge load cell to grade 1 within the measurement range limits of 0.4% - 100% of the nominal load to DIN EN 10002-3, **a resolution of at least 100.000 points** is necessary.

As opposed to the past where measured values had to be read in one after the other, all measured values of the sensors connected to the measurement, control and regulation electronics can be recorded **synchronously** to today's technological status.

Nowadays additional runtime corrections are made between the different preparation methods to make sure that all measured values that are transmitted to the evaluation software are determined at exactly the same moment in time. The MCRE must always make **sufficient slots** available for the user so that all sensors necessary for a test can be collected.

The **online transmission of all test data recorded during the test** to the software for further processing is a very important requirement for enabling testing rapidly and according to test standards. This is the only way that an event controlled influence can be made on the test sequence.

Zwick can enable this high transmission rate (500Hz) to the PC's standard RS interface via an **extremely innovative transmission protocol**. Thus any normal PC can be operated with a Zwick materials testing machine without the need for any additional cards. An **analogue resolution** of > 1.8 Mio. points to 165% of the load cell range enables a load cell to be easily calibrated to accuracy grade 1 with a measurement range start of 0.4% of the nominal value, or to grade 0.5 with *testControl*.

The incremental test data card is prepared with a test data frequency of maximum 20 MHz for the investigation of rapid measurement procedures or measurements with high resolution sensors.
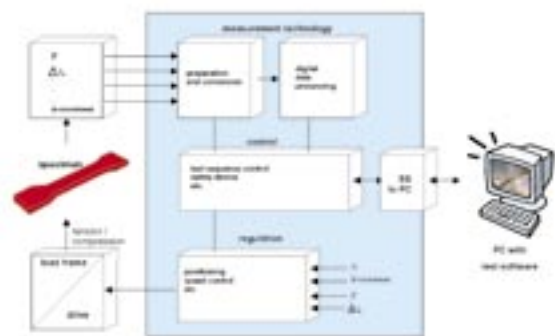
Systematic setup of a measurement and control electronics

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Zwick Guarantees Highest Machine Availability

The use of maintenance free **AC servo-drives** and the **direct mains supply**, that don't require transformers any more, has enabled Zwick to eliminate further potential sources of error. Zwick uses a tried and tested system in the **real time operating system VxWorks** that is put to use not only in mass products (HP printers), but also in high-tech applications such as the NASA Pathfinder or the Very Large Telescope (VLT) of the European, southern astrology society.

Should, in spite of all cautionary measures taken, a fault occur, the down time can be reduced to an absolute minimum via a **diagnostic and remote maintenance tool** (modem connected directly to the electronics).

testControl – More Advantages for the User

testControl is a powerful measurement, control and regulation electronics with modular setup. It is an electronic platform that was developed by Zwick especially for static materials testing machines. **Safety for long term investment and for the future** is guaranteed by the use of most modern technologies and highest quality guidelines during the development. **A modularity setup to the requirements of a materials testing machine** permits individual configuration for each test engineering situation. An elaborate **compatibility concept** permits a continuous expansion of the components at any time. An additional guarantor for investment security in the future.
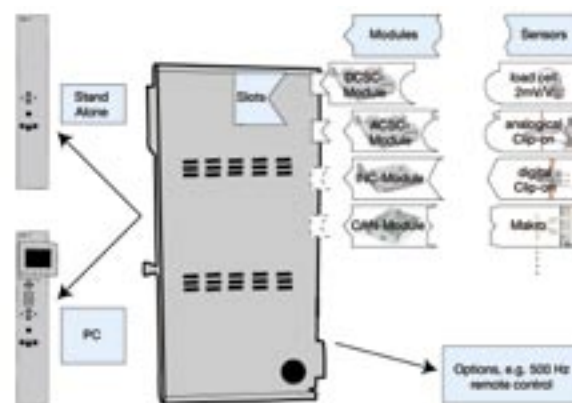
testControl – A Modular Setup

Because of the **modular setup of *testControl***, an **individual test system** can be compiled. You therefore only purchase what you really need. By deciding to purchase a materials testing machine with *testControl* you go for the platform of the future. All new developments, whether a hardware module or a functional expansion, can be integrated in this system very easily. This provides long term security for your investment. *testControl* thereby takes over all time and safety critical tasks concerning materials testing.

The *testControl* setup consists of a core system, modules, options and two different operating variants. All essential functions of the measurement and control electronics are integrated in the core system. This contains, amongst others, synchronous recording of test data from all sensors that are connected to *testControl*. The basic equipment has 4 slots that offer connections for different measurement systems when equipped with the corresponding modules. The number of slots can be expanded without any problems via a bus extension module.

Furthermore, all control functions such as handling the safety device are implemented. The adaptive control algorithm, which guarantees exact positioning and precise preselected speed compliance. In addition, all safety critical protection mechanisms, such as the permissible force for the test arrangement or the permissible safety device forces, are monitored. Via slot modules, such as the incremental test data recording card and options, such as the 500 Hz online test data transmission, the modular setup system can be customized to each necessary test engineering requirement.

Not only the technology, but also the user was essential when developing *testControl*. A lot of attention was paid to further increase the operate ability of the test system. International quality standards and the use of industrial components thereby safeguard your investment on a long term basis.

The *testControl* modular concept

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testXpert® II – Intelligent and reliable

The software takes on a central function for the control of the testing sequence and for the determination, evaluation and display of the characteristic values. By means of the input and output units belonging to the PC system (for example the monitor, printer, keyboard, etc.), the software represents the interface between the machine and the user.

Functions

The essential jobs performed by *testXpert*® II are:
- Setup and reconfiguration of the testing machine
- Preparation for the test or the test series
- Performance of the test
- Evaluation and documentation
- Data management
- Quality management
- Data exchange between *testXpert*® II and other applications (for example Word, Excel)

You can install *testXpert*® II on all commercially available PCs and laptops without the need for any additional connection card. *testXpert*® II will not invalidate any guarantee conditions your computer may have. Moreover, you can install *testXpert*® II on as many computers in your company as you like, and thus have access to your data from various places. Test programs can be prepared on PCs without connection to a test machine or test series can be called up later and further evaluated.

testXpert® II is organized so that you can operate it intuitively. Meaningful icons and clearly designed layouts enable users to become quickly oriented and shorten the initial training period. The menu bar is set up according to the needs of the user whereby working with *testXpert*® II is ingeniously simple.

You only need to insert your administrative data in *testXpert*® II once. *testXpert*® II consistently separates administration and testing, thereby eliminating this work for all new tests. Inputs and information such as:
- General company data (e.g. company name, tester, certificate number)
- Uniform report arrangement and
- Individual input requirements are performed in one place via the Organization Editor for all of your test procedures.

Online Language Swapping

Needless to say, you can have *testXpert*® II in your language of choice. *testXpert*® II speaks more than one language – all you need to do is click the mouse in order to change the language. Language swapping is a function which can be changed at any time, e.g. when setting-up the test report.

testXpert® II helps to prevent maloperation because the necessary entries are subjected to plausibility checks.

testXpert® II offers a Uniform Graphical User Interface for all Types of Testing Machines

- Uniform operation – no differences in operation for new and modernized materials testing machines
- Or for electromechanically and hydraulically driven testing machines

For further information on the *testXpert*® II software please see the relevant brochure.
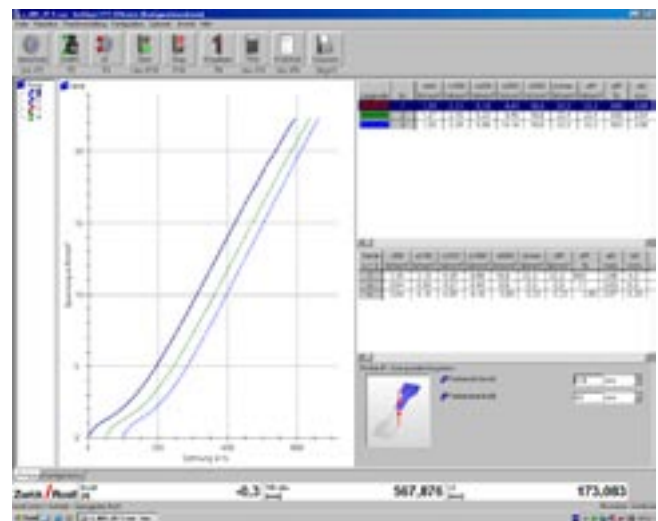
testXpert® II - uniform GUI for all machine types