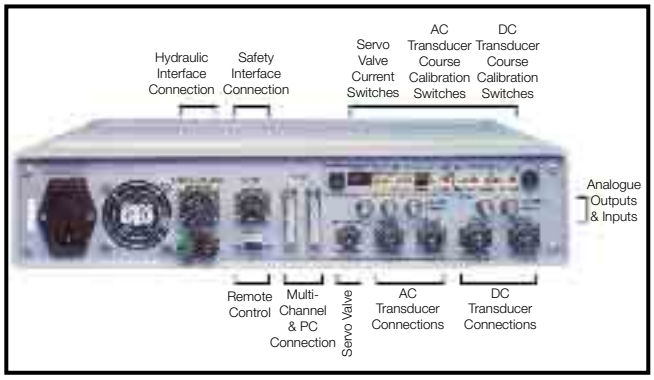
Zwick / Roell

Zwick
Materials Testing

Product Information
Zwick K7500 Electronics

Three K7500 Servo-Controllers



K7500 Servo-Controller – Back View

K7500 Electronics
The Flexible Control Equipment for Mechanical Testing

The K7500 system provides the ideal platform for mechanical test labs. This controller with its functionality spans a broad range of applications from simple part and component tests to complex multiple axis installations for simultaneous testing. Extending the controller hardware by adding a workstation (PC) allows users to generate and perform a wide variety of test programs.

- Single- or multi-channel digital controller
- Soft instrumentation
- Multiple test site operation
- Test programs choices
- Data acquisition choices
- Optional PC-based workstation

Digital Controller

- Stand-alone to multi-channel operation
- Fully digital using DSP technology
- Loop self time feature
- Programmable 16-bit transducer conditioner
- Servo-valves current drive
- Three control modes with hitchless transfer
- Powerful waveform generator
- Low/High hydraulic line pressure selection
- Remote inching pendant
- ±10 V signal input
- ±10 V monitoring outputs
- Hardwired emergency stop button
- Optional: PC-based workstation for data acquisition and extended test programs

PI 514 2.1204

K7500 Series Configuration

The K7500 series equipment offers configuration flexibility ranging from single channel cyclic test to multi-test site, multi-axis testing using real-time input, simulation, and data acquisition.

- Single-channel digital servo-controllers
- Multi-channel digital servo-controllers (master/slave configuration)
- PC-based workstation available with multiple test site operation and software instruments
- Diverse test programs available for block tests, real-time load spectrums, service load simulations, and data acquisition

Operation of the K7500

The K7500 servo-controller uses fast-access push buttons to lead you through its multi-layer menu, with soft adjustments made using a tactile rotary control and back-lit LCD display. Individual test settings may be saved in the audits memory banks and recalled at any time.

K7500 Control Keyboard

Features

- Four signal-conditioning amplifiers
- Choice of drive current
- Three control modes with hitchless transfer
- Software-configurable multiple-input control loops
- Limit event history logging
- Hydraulic system pressure control

Safety System

The K7500 uses a continuous two-tier checking system for all its transducer adapters. Each signal is compared with lower and upper limits designed to provide a warning and a shut-down condition. Other safety monitoring features are error tracking, emergency stop buttons, external limit switches, cable continuity, and a vast array of self-checks. All of these are interlocked with the K7500‘s off and low- and high-pressure selection buttons.
A continuously updated limit event log which records 300 in a circular buffer is provided. The events include key operator options and automatic safety limits. An optional remote inching pendant is available for initial set-up. This provides a fine inching control with limited loading capability to prevent over-loading the test specimen.

The K7500 Function Generator

The function generator provides sine, square, triangular, and saw-tooth waveforms up to a frequency of 200 Hz and, for multi-channel operation, harmonic selection of up to 1000 Hz. Users are able to enter the requirements in direct engineering units, either in amplitude and bias format or in upper and lower peak definition. When starting or stopping a test, the selection dynamic waveform is controlled by a soft-fade feature that ensures the smooth transition of the test. This feature, which includes programmable fade rates for static and dynamic components of the test, is also available for external input test ware forms.

The test duration at a fixed frequency can be specified either as a given time period or number of cycles.

Peak Adaptation Control

The peak adaptation control feature offers an automatic method for modifying the command amplitude to maintain a constant output. This adaptive system can use either the controlled variable or an independent variable as the required output. Thus, it is particularly well suited for tests where a constant acceleration amplitude is to be achieved in a position control system at variable frequencies.

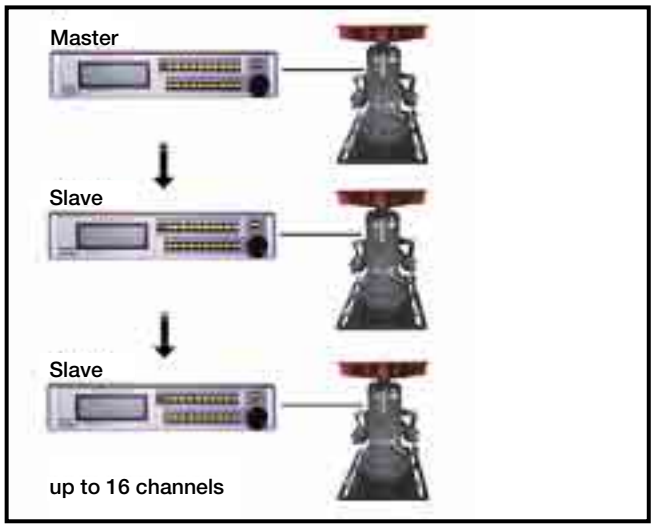
Multi-Channel Application

When the K7500 servo-controller is deployed in multi-channel applications via KiNet, the master/slave configuration enables utilization of harmonics and phase shifts between the channels.

Dynamic measurements of the sensor and system signals are visualized using two digital displays with automatic range selection. The technical units that are assigned to the sensors of the testing system are employed.

K7500 Servo-Controller - Technical Data

The K7500 servo-controller offers manifold options for the harmonization of servo-control systems, thus optimizing the response behavior and stability of the control system. Control channels can be tuned either automatically or manually as desired.



testXpert® - Uniform GUI for All Machine Types

Digital Display and Monitoring:	Number of digital displays: 2 Resolution: 5 digits, auto-ranging Display modes: direct, max., min., upper peak, lower peak, and peak-peak Programmable 15-input signal selector Programmable BNC outputs: 3
Dimensions:	470 mm x 394 mm x 114 mm (W x D x H)
Weight:	9 kg
Voltage Supply Requirements:	Power consumption: 120 VA Voltage supply: 88 – 132 V and 176 - 264 V, 48 - 63 Hz

K7500 Servo-Controller - Technical Data
(Continued)

Test Management:	Manual set point adjustment (dial) Ramp generator for static tests External analog control input Eight storage banks for test and setting parameters Waveform generator: Sine, rectangular, square, and ramp waveforms Frequency range (basic frequency): 0.000001 to 200 Hz Cycle or time counter (increment or decrement) Soft fade-in and fade-out of dynamic control commands for internally or externally generated signals Master/slave configuration: Synchronized functions Frequency range (harmonics up to the 5th order of magnitude) 1000 Hz Phase shift range 180° in 1° increments Global command control „master unit“ Set point adaptation: Constant amplitude regulation for controlled or independent variables PC connection via KiNet optional
Servo-Control:	Three control modes with hitchless transfer and startup PIDF control with runtime compensation filtering and additional increase in the p component for gain boost P 1 to 512 V/V, I 0 to 150 rps, D 0 to 60 ms Algorithm for auto-adaptation of control loop Input for inner control loop Piston area ratio compensation External analog input for control loop balancing Programmable frequency and amplitude for valve dither: 0 to 1000 Hz, 0 to 20.5% valve current System resolution: 16-bit Programmable servo-valve current from 5 to 200 mA in 5 mA increments Refresh rate of servo-valve: 2 kHz Programmable phase reversal of the servo-valve
Signal Processing Measured Value Converter:	Five sensor channels: two DC and two AC signal processing channels and one external input Programmable amplification, zero deviation with 16-bit A/D conversion Programmable low-pass filter frequency from 1 to 1000 Hz Assignable to the control loop job with selection from a variety of technical units DC signal processing: amplification range 1 to 1000 V/V CMRR ≥100 dB, DC to 100 Hz, at G=500 and 1% unbalance of the supply voltage Connection: 4-, 6-, and 9-wire circuitry Supply: ±2.5 or ±5 V, 120 Ωmin. Bipolar resistance calibration AC signal processing: amplification range 0.5 to 20 V/V CMRR ≥95 dB of DC up to 60 Hz Supply: 2.5 or 5 Veff. at 5 kHz Demodulation phase control up to 45°