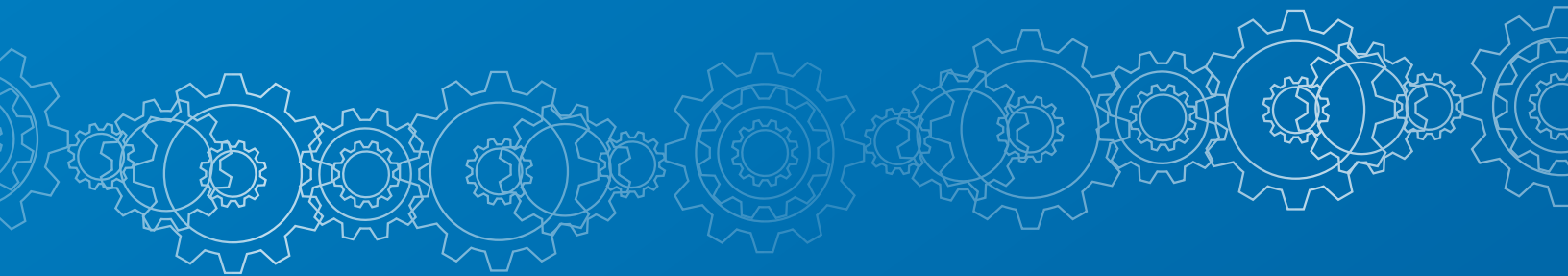# MTS FlexTest® Controller Family

A versatile, modular controller platform for all your testing needs

MTS FLEXTEST CONTROLLERS ARE THE RELIABLE, COST-EFFECTIVE SOLUTION FOR YOUR CURRENT AND FUTURE TESTING NEEDS. THESE MODULAR CONTROLLERS ALLOW YOU TO SHARE HARDWARE BETWEEN CONTROL SYSTEMS AND LABS, ARE EASILY RECONFIGURED FOR A WIDE VARIETY OF TEST APPLICATIONS, AND CAN BE EXPANDED TO ACCOMMODATE NEW TEST NEEDS IN THE FUTURE.

MTS FlexTest Controller Family

Versatile, modular digital controllers

The scalable family of FlexTest controllers all use the same Series 494 hardware.

Experience the Expertise

MTS offers unrivaled expertise in the field of precise force and motion control. Engineers in dozens of industries throughout the world rely on MTS' testing equipment and state-of-the-art software to validate designs and to test the durability and performance of products and structures. From automobiles to aircraft, from bridges to buildings, from medical devices to manufactured goods, MTS delivers the necessary technology and know-how to help you accurately test your materials, designs and products.

The FlexTest controller family is a set of controllers that all use the same Series 494 hardware modules. This modular hardware platform allows you to save time and effort in training and in test setup, and enables an easy, cost-effective way to expand your testing capabilities.

The design of FlexTest controllers is based on decades of MTS expertise in providing solutions for structural, system, component and material testing as well as MTS' vast experience in delivering and supporting many thousands of digital controllers across the globe. This family of controllers provides high-speed closed-loop control, function generation, transducer conditioning and data acquisition to address the full spectrum of testing needs.

The Series 494 hardware is the result of more than forty years of controller development experience at MTS. This hardware platform is our 4th generation of digital, and the 3rd generation of modular digital controllers; and is an extension of the technology leadership and innovation that have created MTS' reputation for superior controls. These controllers all share a common set of conditioners, valve drivers and I/O modules.

TEDS CAPABILITIES

Transducer Electronic Data Sheets (TEDS) capabilities comply with the IEEE 1451.4 standard and help ensure that appropriate calibration information is used.

FLEXTEST 200 CONTROLLER – up to forty control channels, and up to eight test stations

FLEXTEST 100 CONTROLLER – up to sixteen control channels, and up to eight test stations

FLEXTEST 60 CONTROLLER – up to eight control channels, and up to six test stations

FLEXTEST 40 CONTROLLER – up to four control channels on one or two test stations

MTS FlexTest Controller Advantages

MTS provides reliable, easy-to-use, and cost-effective controllers which can be enhanced to meet new test requirements in the future.

MTS controllers have distinct advantages in:

» Test design and automation

» Test control

» Controller versatility

» Controller longevity

ADVANTAGES IN TEST DESIGN AND AUTOMATION are realized through the use of powerful and flexible software applications which enable you to design and automate virtually any test procedure.

ADVANTAGES IN TEST CONTROL are realized by various adaptive compensation techniques which provide tools for controlling complex tests on difficult specimens.

ADVANTAGES IN CONTROLLER VERSATILITY are realized by enabling any hardware resource such as valve drivers or conditioners to be used for any test station. You can easily reallocate hardware resources to reconfigure your controller for different test arrangements.

ADVANTAGES IN EXPANDING CONTROLLER CAPACITY AND LONGEVITY are realized by use of modular architecture including centralized processors which can be easily upgraded in the field. Additional test resource boards can be added. These capabilities help you to cost-effectively expand your controller capacity and/or extend the productive life of your controller investment.

Model 494.05 Handset

The Model 494.05 handset provides an easy, convenient, and compact means to install and replace specimens, and to setup and initiate tests at the load frame or test rig. It is available for all the FlexTest controllers that use Series 494 hardware.

HANDSET FEATURES INCLUDE:

» Exclusive control – to prevent control of actuator movement from any other source

» Speed-sensitive thumbwheel – for precise control of the actuator

» Multi-line text display – for easy viewing of system information

» Display Pages – for Manual Command, Auto Offset and Program Run operation

HANDSET FUNCTIONS INCLUDE:

» Temporarily override and reset interlock

» Energize and de-energize hydraulic pump and hydraulic manifold

» Easily view multiple signals for one or more control channels

» Conveniently move actuators to install and replace test specimens

» Auto-offset selected transducer signals

» Start, pause and stop the test application program

Multi-Step Lab Migration

In addition to being an ideal solution for new installations, the FlexTest controller provides the ability to migrate existing labs from older analog controls in multiple cost-effective steps.

You can migrate your lab one channel at a time, or all at once — whatever is best for you.

LAB BEFORE FLEXTEST CONTROLLER

» Existing servo-controllers, typically analog and often single-channel

» No automation

» No data acquisition

» No ability to observe signal traces

» No support for RPC® software

AUTOMATE EXISTING ANALOG CONTROLLERS WITH FLEXTEST SUPERVISOR TO REALIZE NEW CAPABILITIES

» Automated tests

» Customized tests

» Block-cycle tests

» Multi-channel tests

» Data acquisition

» RPC time history drives and responses

» Specimen protection while loading (CLC)

» Various control compensation techniques

» Multi-station tests (on one or multiple PCs)

CHANNELS CONVERTED TO FULL FLEXTEST CONTROL SUPPORT, EVEN MORE NEW CAPABILITIES

» Mode-switch

» Bumpless start

» Auto-zero

» Tuning (or auto-tuning) for all channels

» Save and restore PID settings

» Save and restore test files

» Simpler re-configurations

» Simpler setups (limits, etc.)

Any 10-Volt Controller

Any 10-Volt Controller

Remote E-Stop
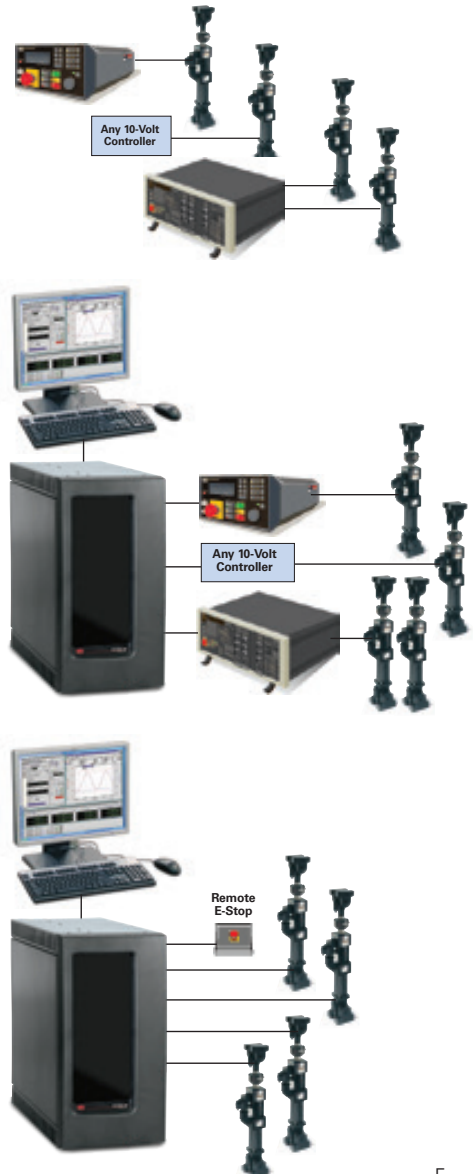
Increase Productivity with Proven Software

Sophisticated Information Management

FlexTest software has an intuitive graphical interface that makes it easy to quickly configure your controller for a wide range of testing applications.

DEFINE YOUR WORKSPACE

Choose the information you want displayed during a test. FlexTest software allows you to position and size system status information, including digital meters and scope displays, on your PC monitor.

Multiple Stations

DEFINE SEPARATE VIEWS

You can define separate views for each test station. Your stations will open to automatically show the views you have selected. You can open and close all the windows you wish, and then easily revert to your favorite view at the click of a button.

FOCUS ON ONE STATION

With Station Desktop Organizer, you can focus on one station at a time. Most of the PC monitor is dedicated to your station of choice, while a small area is used to keep you informed of the status of other open stations.

SWITCH VIEWS

Just click your mouse to switch views from one station to another.

MULTIPLE OPERATORS

FlexTest software allows multiple operators to simultaneously run separate tests on one controller, without having to share a PC. The PC-per-Station option allows each operator to have their own PC, and is very useful in multi-station applications where the test rigs are located in different areas.

Project Management

The Project Manager feature allows you to better organize your files. This feature is particularly helpful when using multiple stations or when multiple operators are accessing common systems.
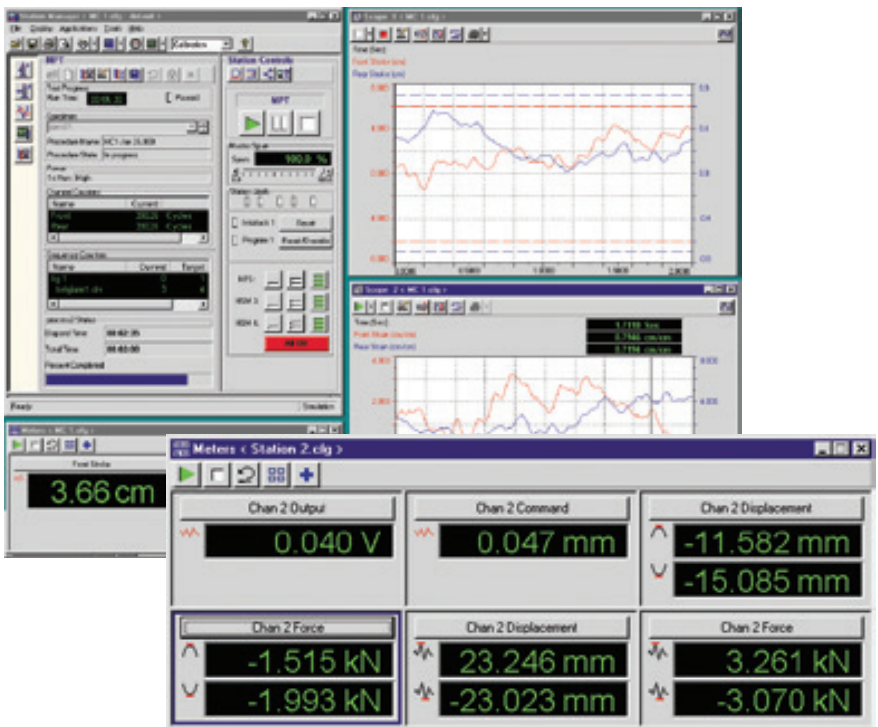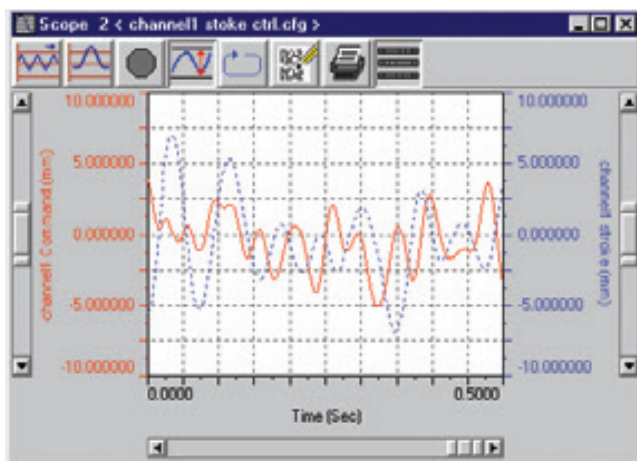
Accurate Test Control

FlexTest controllers support adaptive control compensation techniques, calculated channels, cascade control, and interoperability with RPC software to adapt actuator controls to meet test requirements for your specimen and achieve accurate results.

Compensation Techniques

Each compensation technique is optimized to meet specific application needs. These techniques enable you to more accurately control your tests. You can realize desired end levels even while specimen characteristics change.

» **NULL PACING** ensures desired levels are reached on initial cycle without over-programming.

» **PEAK VALLEY CONTROL (PVC)** adapts as specimen compliance changes to ensure peaks and valleys are maintained for any constant amplitude periodic waveform.

» **PEAK VALLEY PHASE (PVP) CONTROL** adapts for phase as well amplitude for multi-channel cyclic tests. PVC can correct for phase even with distorted waveforms.

» **ARBITRARY END LEVEL CONTROL (ALC)** can adapt for linear or non-linear specimens with periodic or random waveforms.

» **ADAPTIVE INVERSE CONTROL (AIC)** can be applied to any waveform, including random profiles or RPC time history files in linear systems. An example of how AIC can greatly improve tracking to desired command is illustrated in the two charts below.
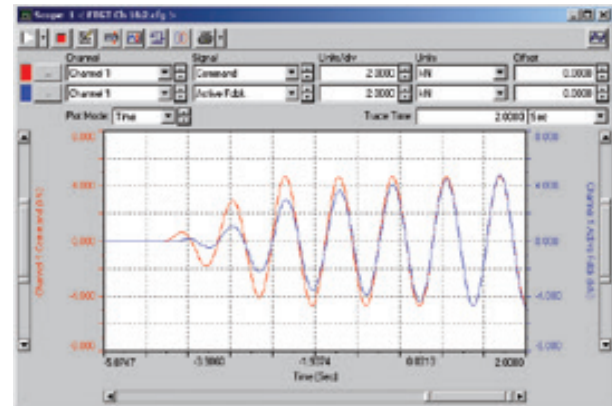
Calculated Channels

The FlexTest control system enables you to easily define calculations from input signals. Available mathematical functions include: +, -, x, /, cos, exp, ln, log, power, sin, tan, and time. It is possible to use one defined calculation in another calculation.

Cascade Control

With optional Cascade Control you define feedback signals for each of two control loops on one actuator. The command to the outer loop uses one signal (e.g. load) while most of the actual control is performed by the inner loop with the other signal (e.g. stroke). This enables better tuning and system response in cases where the specimen stiffness varies significantly as a function of temperature or wear.

Without AIC

With AIC

With Adaptive Compensation, the command is adjusted in real time so the achieved response matches a target signal.

All of these compensation techniques are useful in certain test applications. They work for any control mode, including dual-mode control.
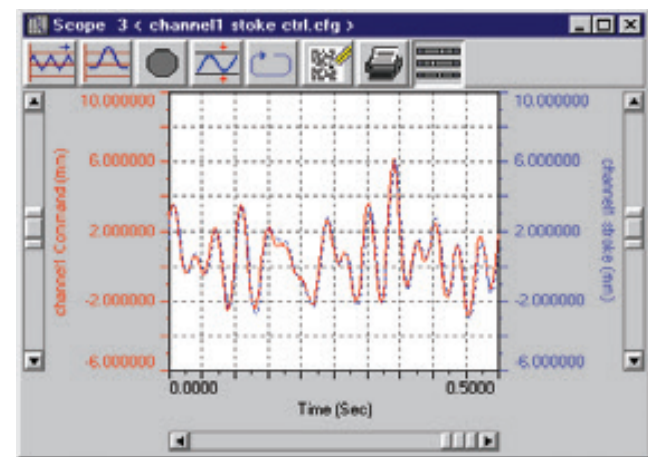
Interoperability with RPC

FlexTest control systems can also interoperate with RPC software – either through networking or by having the RPC software reside on and run from the FlexTest control system PC.

MTS Series 793 Application Software

MultiPurpose TestWare (MPT) Software

MPT is powerful application software that enables you to easily automate test procedures. You can quickly create your own test sequences, including any sequence of command generation and data acquisition. New test requirements can be satisfied in a few minutes by designing a new test and saving it for future use. You are not limited as you might be with a fixed-function application.

This flexibility extends to data analysis. The software saves data from your tests in a standard format, allowing you to use your favorite spreadsheet program or analysis package. This gives you total flexibility in analyzing, plotting, or reporting your data.

INTUITIVE OPERATION

The mouse-driven graphical user interface makes MPT software easy to learn and use, especially with its drag-and-drop means for defining tests. You'll spend more time testing and less time learning and setting up the system.
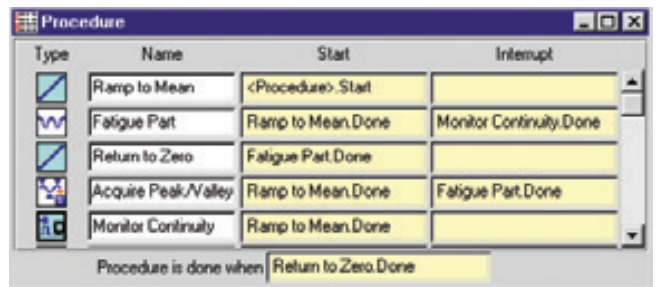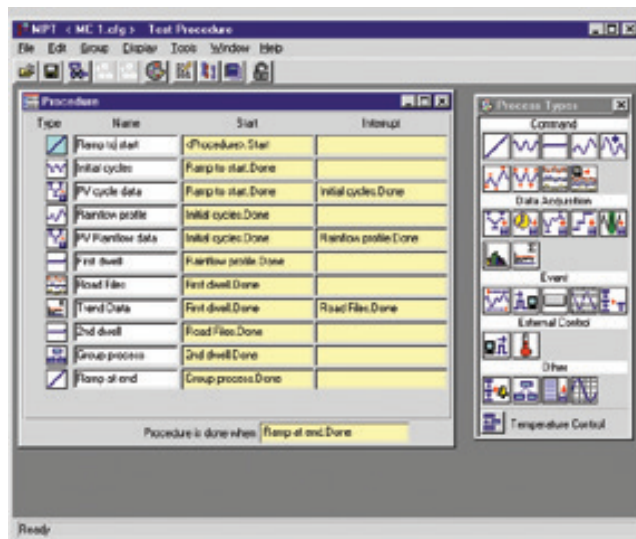
For more information about MPT software, see the MTS MultiPurpose TestWare brochure, part number 100-213-363.

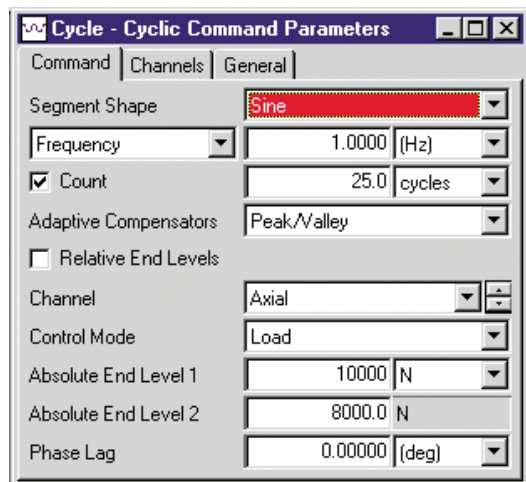## Powerful Test Design made Fast, Flexible and Easy
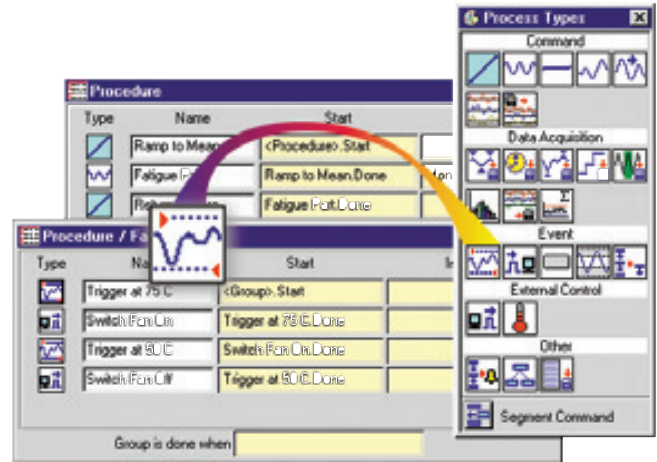
SELECT THE PROCESSES

Available processes are displayed as icons on the Process palette. Select the icon, drag it to the table, and drop it in place.

CONNECT THE PROCESSES

Establish the order in which processes execute by connecting them with other processes.

DEFINE THE PROCESS PARAMETERS

Define the specific test parameters for each process, such as ramp time, end-levels, and frequencies.

Faster Test Design with MPT Variables

MPT VARIABLES allow test developers to easily create and edit automated test procedures, significantly increasing test flexibility and productivity.

Imagine that you would like to run various cyclic blocks at several different end levels but at a common frequency, and at the end of the test, you want to review results and reset the common frequency based on prior test results. Without MPT Variables, you would need to open every cyclic process to change the frequency for each cyclic process. With end levels set as a MPT Variable, the Variables Editor can be used to simply change the frequency value in one location for all cyclic processes that reference that particular variable.

MPT Variables also make it easier to adjust the frequency while the test procedure is running. The Operator Information Process is used to enable variable change without stopping and unlocking the test, making changes fast and easy to implement.

MPT VARIABLES (793.23)

» Test designers can define, view, and change MPT process variables without having to access individual processes

» Creating and editing test procedures is faster and more reliable, particularly for procedures involving large numbers of processes.

» Test designers can create tests with loops that use different values for each pass, making tests more compact and quicker and easier to define.

» For added convenience, the Operator Information Process enables test designers to designate variable values that can be changed while the test is running.


MTS TestSuite Software Platform

MTS TESTSUITE™ SOFTWARE provides new tools for creating and running tests, generating reports and analyzing test data for material and component tests. It gives you more control over your testing operations than ever before. Calculations are transparent and modifiable, so that you can use the testing templates provided by MTS, modify those templates or develop your own. Test design is done through a graphical workflow interface that allows designers to see the tests they are creating in a flow chart format. Creating tests, even those with complex and parallel workflows, is simple and fun.
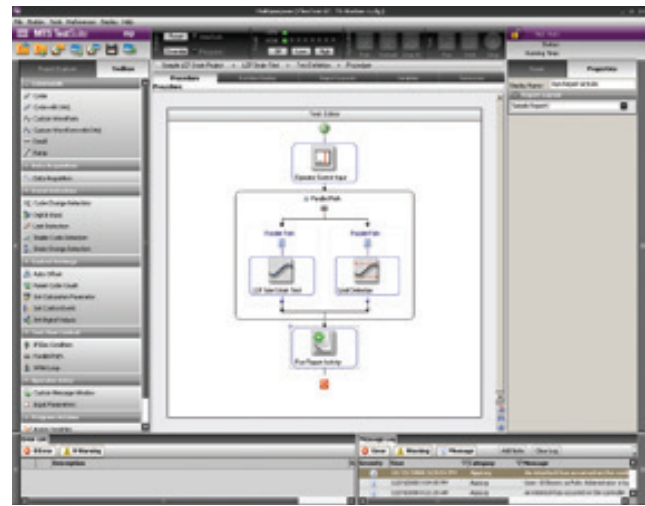

Other Application Software

» **RPC® CONNECT SOFTWARE** minimizes testing time through advanced editing, analysis, and simulation capabilities. RPC Connect software can complement existing test systems or provide a powerful application for new test simulation that can be customized and automated to meet your specific needs.
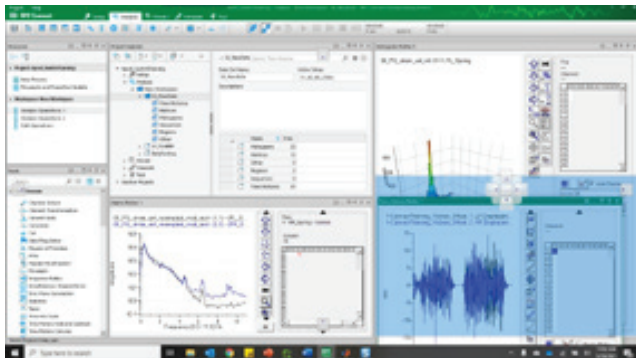
» **AEROPRO™ SOFTWARE** is designed specifically to manage the large-channel-count static and fatigue structural tests required in aerospace structural testing. Allows users to view test status, scan data or continuous run-time data with multiple data types in a single display.
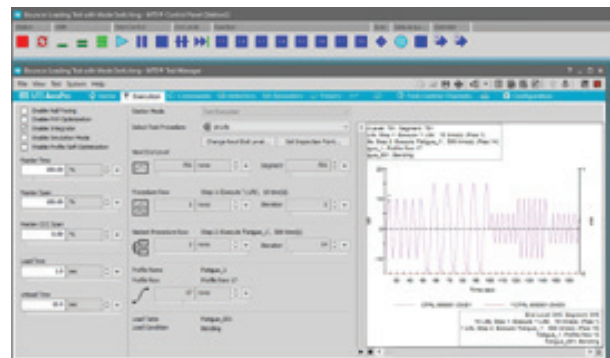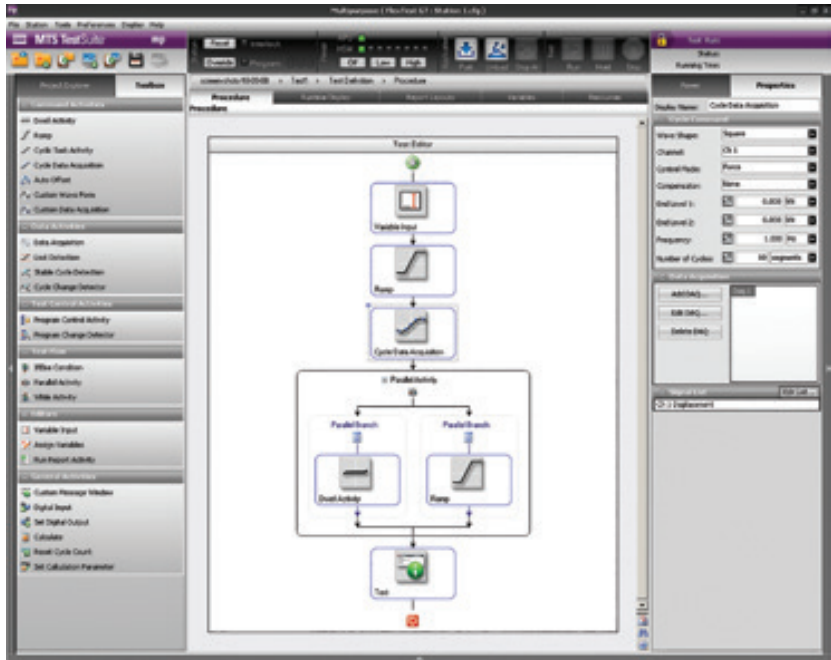
Materials Testing

For decades, MTS has been creating material testing solutions for several industries. Our superior software and controls, combined with our state-of-the-art load frames, provide the utmost reliability and repeatability of material test results.

Innovative Hardware

» **EASY-TO-USE HANDSET** – allows you to easily install and replace test specimens at the load frame.

» **TEDS SUPPORT** – complies with IEEE 1451.4 standard, to recognize the connected TEDS transducer and help ensure that appropriate calibration information is used.

» **MULTI-STATION SUPPORT** – maximizes productivity and minimizes your expense. Each test operator can use their own PC and simultaneously run separate tests on one controller.
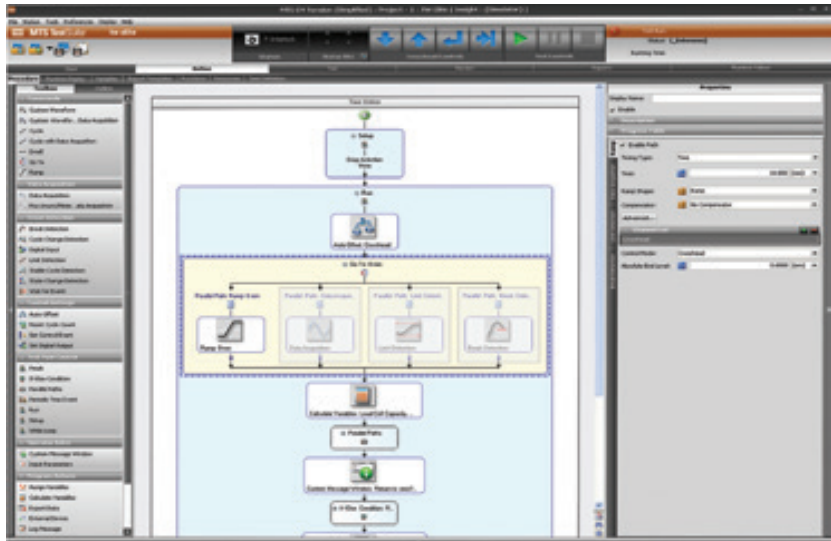
Proven Software

MTS TestSuite MP Software

FOR A WIDE VARIETY OF TESTS, ON A VAST ARRAY OF MATERIALS, MTS HAS THE COMPLETE TESTING SOLUTION.

TESTS: Tensile. Compression. Shear. Tear. Fatigue. Fracture. *And more.*

MATERIALS: Plastics. Metals. Adhesives. Ceramics. Elastomers. Resins. Propellants. Carbon Fiber Composites. *And more.*

MTS TestSuite TW Software

Flexible, precise control

MTS material testing systems are ideal for not only standard dynamic testing requirements, but also for tougher challenges including high-frequency, multi-axial and axial-torsional applications. These servohydraulic systems:

» Perform reliably during long-duration fatigue tests

» Resist side loads and deflections to maintain precise alignment

» Can be configured with a broad range of extensometers, force transducers, grips, fixture and environmental chambers

» Provide the ultimate in testing flexibility.

The biomedical industry is just one of the many industries that benefit from MTS testing expertise. Product development scientists use MTS Bionix® products to accurately and cost-effectively conduct tests that allow them to shorten time-to-market and meet regulatory requirements. They rely upon MTS Bionix solutions to perform quality control and verification tests, to assure the highest quality and reliability of their medical products.

With MTS FlexTest controllers and Series 793 application software, biomedical product developers can:

» Evaluate materials and product designs early in the development cycle

» Simulate biological forces and displacements

» Characterize biomaterial properties

» Measure quality control and quality assurance.
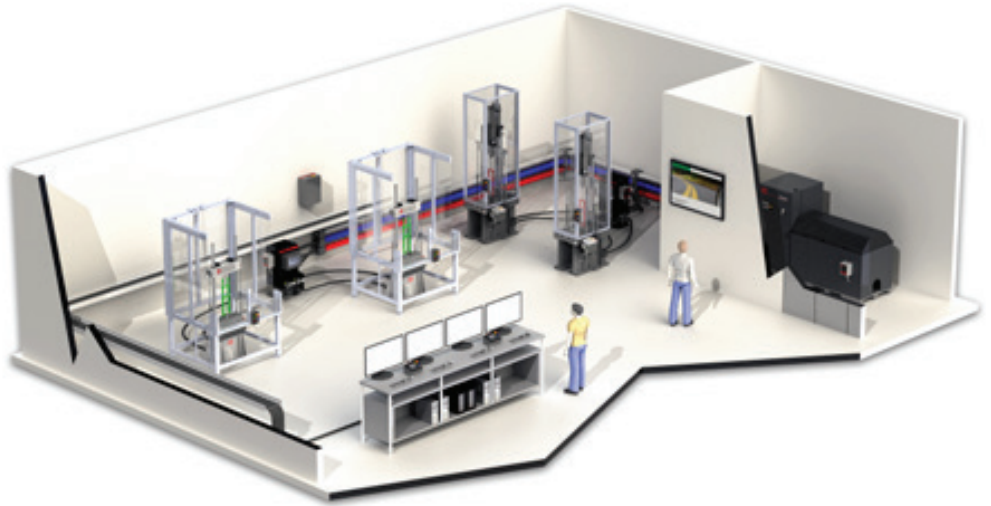
MTS understands the importance of gaining high quality component and subassembly test data; so we provide a broad set of testing solutions, including: powerful control and data acquisition software, test application software, versatile controllers, and reliable hydromechanical products to address a full range of component testing needs.

Test seats, radiators, instrument panels, HVAC subsystems, engine mounts, fuel tanks and more with MTS controllers. The FlexTest controllers integrate several key algorithms to speed testing, including: Adaptive Inverse Control (AIC), Amplitude Phase Controller (APC) and Three Variable Control (TVC).

Innovative Hardware

» **SMALLER AND LIGHTER** – the FlexTest controllers are smaller and much lighter than other controllers for most system and component test applications.

» **GREATER CONFIGURABILITY** – safely re-configure a test while other tests are running on the same controller.

» **GREATER FLEXIBILITY** – the modular platform makes it easy to match your channel requirements with the most cost-effective solution.

Proven Software
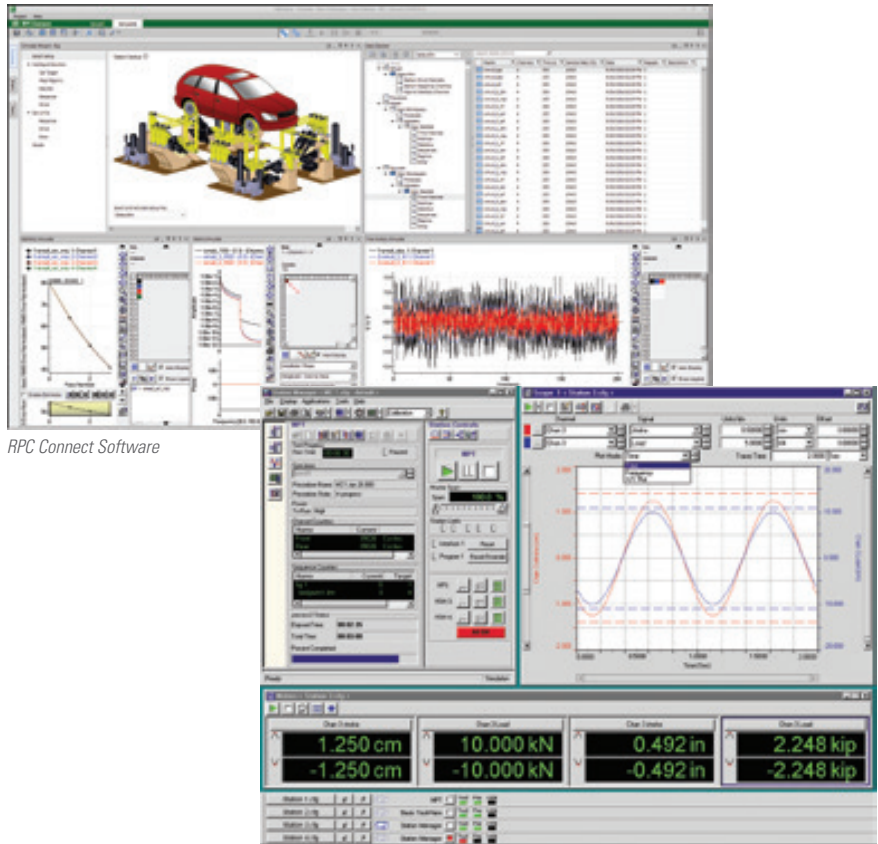
RPC Connect Software

MultiPurpose TestWare Software
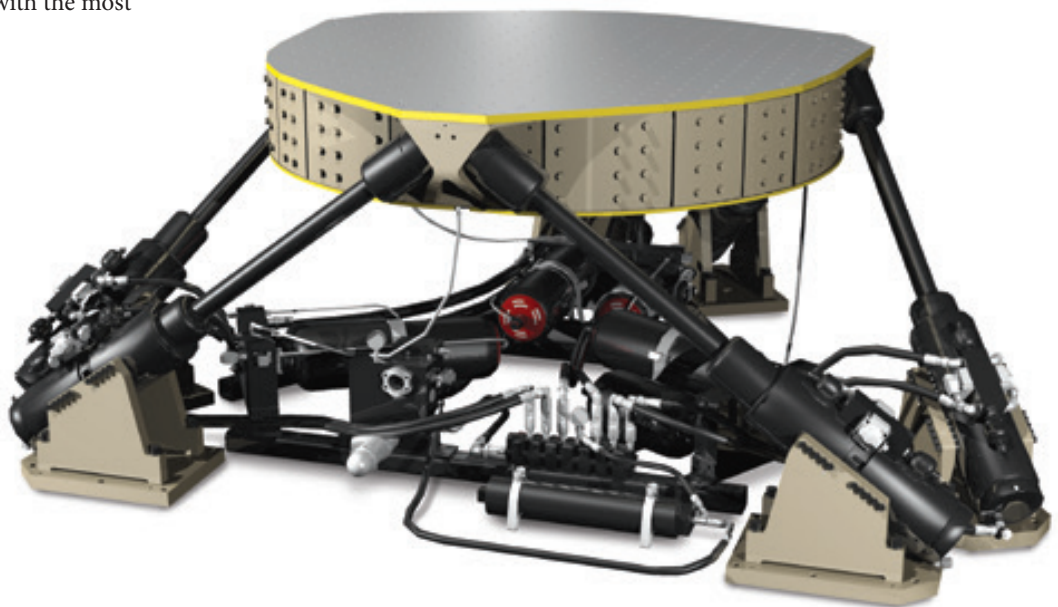
For full-vehicle testing, the reliability and repeatability of results is critical to success. For more than fifty years, manufacturers have trusted MTS to provide testing solutions that can efficiently and accurately validate vehicle design. And over the years, MTS has continued to offer innovative hardware and software solutions for vehicle testing. The scalability of the FlexTest controller hardware is one of the latest improvements in testing technology. Now you can easily expand to larger channel counts, and can accommodate more test rigs, stations, and test operators while maintaining the accuracy you require.

Additionally, you gain several advantages when using the MTS controller hardware with industry-standard RPC Connect software:

» Native support for data formats
» Anti-aliasing filters
» Real time calculations (matrix control)
» Mode switching.

Superior controls and software help ensure reliable, repeatable results.
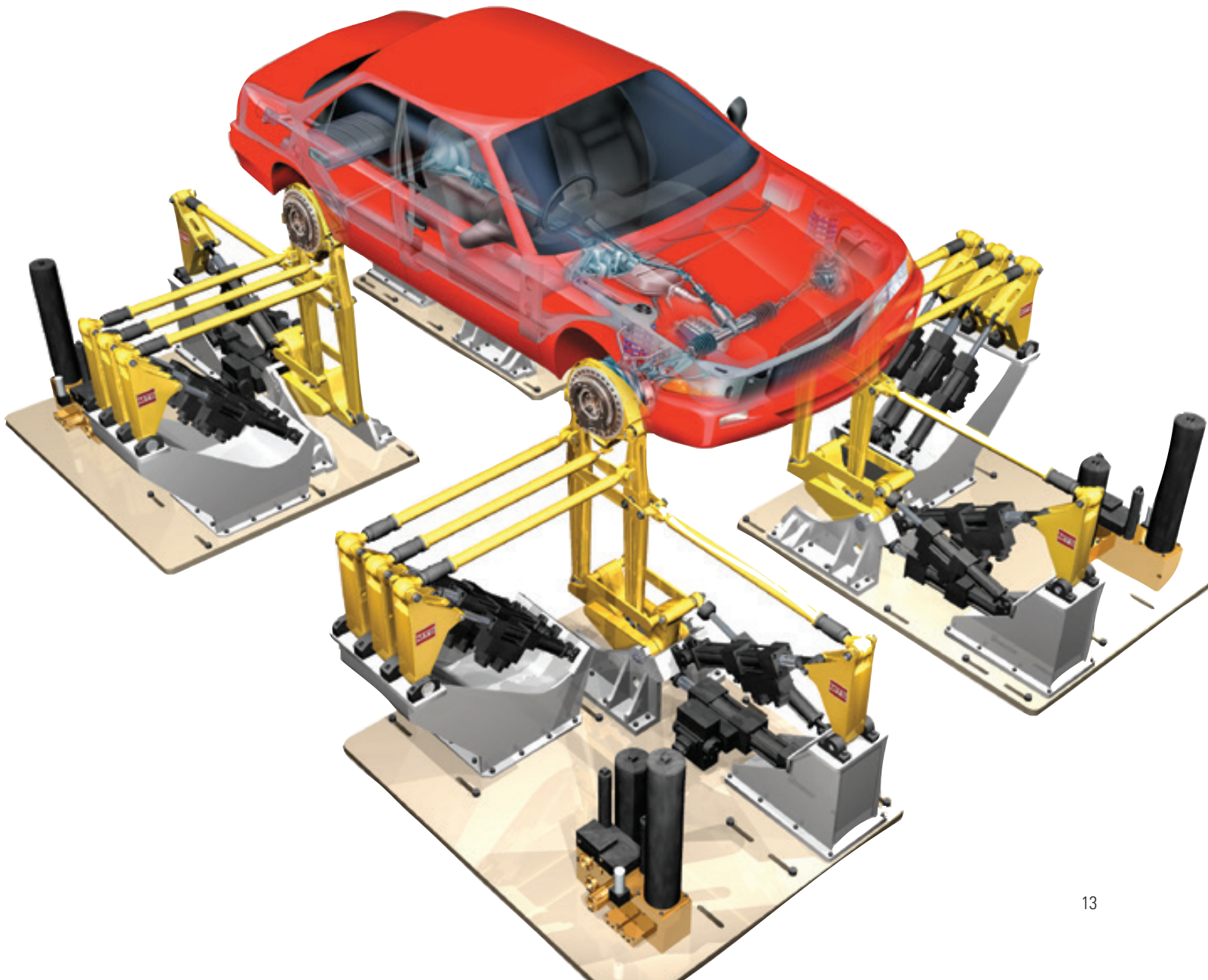
Structural Testing

MTS controllers have been integral to aerospace structural testing for decades. The FlexTest 200 controller brings additional capacity to aerospace test labs, and can manage up to 40 channels and 8 stations in a single chassis. Multiple chassis can be connected in a system to support tests with over 300 control channels. Multiple operators and remote rig locations can be easily accommodated in multi-station applications.

Aero Control System Advantages

Innovative Hardware

» **COMMON HARDWARE PLATFORM** – the FlexTest 200 controller uses the same hardware platform found in all other MTS Series 494 control systems. The resulting compatibility allows you to leverage your controller investment across both your structural testing and material testing departments.

» **EXPANDABILITY** – address changing requirements with affordable upgrades and add-on capabilities instead of new control system purchases.

» **INTEGRATED CHASSIS ARCHITECTURE** – minimal internal cabling means fewer problems and easier serviceability.

» **TEDS SUPPORT** – complies with IEEE 1451.4 standard, to recognize the connected TEDS transducer and ensure that appropriate calibration information is used.

» **MULTIPLE CONTROLLERS** – connect multiple controllers together for Aero structural tests with larger numbers of control channels.

Proven Software
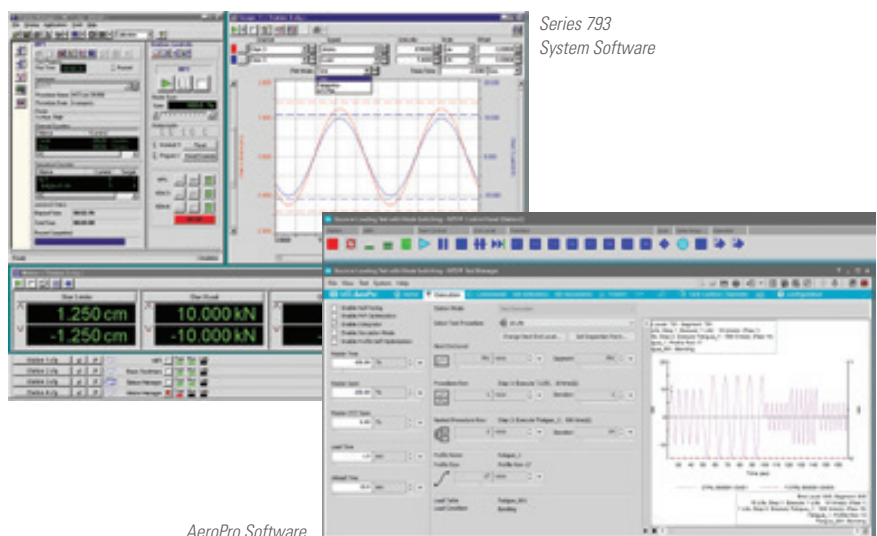
Series 793 System Software

AeroPro Software

MTS Reliability

It is what you would expect from the leader in servohydraulic testing solutions: a controller family that uses a common set of versatile modules to meet any testing need. MTS will continue to support you with innovative, modular hardware solutions, and time-tested software to help meet all your testing requirements. With the FlexTest controllers, you can experience even higher channel densities and capacities, greater configurability, more setup options, support for TEDS, and other improvements to make your testing more reliable. You can count on MTS to continue to provide versatile, reliable, usable control solutions that bring value to your testing operations.

Unparalleled MTS Service and Support

For more than fifty years MTS has been a world-leading supplier of test systems to manufacturers in the automotive, aerospace and other industries. A key component of our success over the decades has been our worldwide service organization. Regardless of your size or location, MTS is committed to optimizing your return on your FlexTest controller investment. To help you maximize the productivity of your testing system we offer planned professional maintenance, responsive local support, hands-on training programs, accurate and up-to-date technical documentation, and accredited calibration services. To resolve more complex engineering or process challenges, we field an experienced global consulting team. MTS is ISO 9001 certified, and our controller and application software packages are designed and manufactured in accordance with ISO 9001 practices.

The Series 494 DUCs (Digital Universal Conditioners) can work with most AC transducers and DC transducers. You can use the same DUC to condition an LVDT for one test, and then to condition a load-cell for the next test. These are full-range conditioners, meaning they accurately cover the full scale of the transducer while providing the resolution and repeatability needed when measuring small percentages of that range. There is no need to select between ranges for a transducer. FlexTest controller settings and test setups are easily repeatable because you can save and retrieve configurations.

Full-Range conditioning is available in three mezzanine cards:

- » 494.16 Valve Driver/DUC card
- » 494.25 Single DUC card
- » 494.26 Dual DUC card:
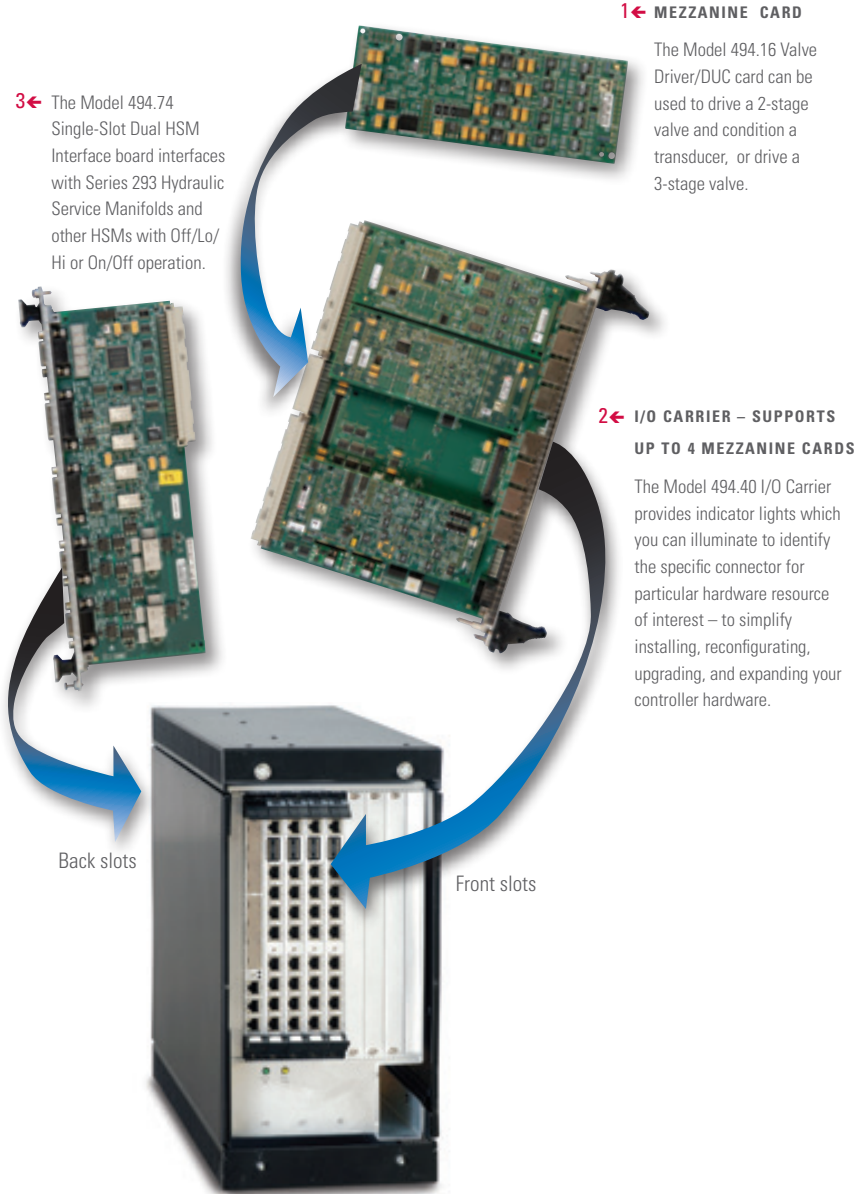
SERIES 494 HARDWARE INCLUDES:

- » 494.96 MVME Processors
- » Mezzanine Cards: ←1
  - – 494.16 Valve Driver/DUC card
  - – 494.21 Multi-Range DUC & Accelerometer Adapter
  - – 494.25 Single DUC card
  - – 494.26 Dual DUC card
  - – 494.45 8-Input A/D card
  - – 494.46 8-Output D/A card
  - – 494.47 Dual UART/Encoder interface
- » 494.40 I/O Carrier holds mezzanine cards ←2

FLEXTEST 40 CONTROLLER

- » 494.41 or 494.42 System board
- » 494.44 Two-Station System board, with optional 494.32 DIO breakout box & 494.33 DIO power supply

FLEXTEST 60, FLEXTEST 100, FLEXTEST 200 CONTROLLERS

- » 493.73 HPU interface board
- » 494.74 Dual HSM interface (On/Off or Off/Lo/Hi) ←3
- » 494.75 8-Input BNC board
- » 494.76 8-Output BNC board
- » 494.31 High-Power DIO breakout box with 494.33 DIO power supply
- » 493.72 Digital I/O interface board
- » 493.74 Dual HSM interface board
- » 494.49 Quad Encoder interface

FOR AERO STRUCTURAL TESTING

- » 494.43 Multi Chassis interface board
- » 494.79 8-Channel valve driver board

3← The Model 494.74 Single-Slot Dual HSM Interface board interfaces with Series 293 Hydraulic Service Manifolds and other HSMs with Off/Lo/Hi or On/Off operation.

1← **MEZZANINE CARD**

The Model 494.16 Valve Driver/DUC card can be used to drive a 2-stage valve and condition a transducer, or drive a 3-stage valve.

2← **I/O CARRIER – SUPPORTS UP TO 4 MEZZANINE CARDS**

The Model 494.40 I/O Carrier provides indicator lights which you can illuminate to identify the specific connector for particular hardware resource of interest – to simplify installing, reconfigurating, upgrading, and expanding your controller hardware.

Back slots

Front slots

FlexTest 40 Controller

One-station version with 494.41 or 494.42 system board

Back (4 slots)

Front (no slots)

Two-station version with 494.44 system board

FlexTest 60 Controller

Front (6 slots)   Back (8 slots)
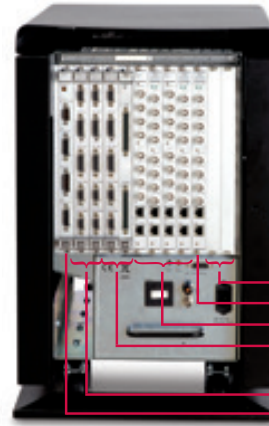
FlexTest 100 Controller

494.96 MVME Processors
494.40 I/O Carrier boards
Room for expansion

Room for expansion
494.76 8-Output BNC board
494.75 8-Intput BNC boards
493.72 Digital I/O Interface board
(connects to screw-terminal break-out box)
494.74 HSM Interface boards
493.73 HPU Interface board

Front (10 slots)   Back (12 slots)

FlexTest 200 Controller

Front (20 slots)   Back (20 slots)

Specifications

	FlexTest 40		FlexTest 60	FlexTest 100	FlexTest 200
Configurability	No configuration constraints. Any input can be assigned to any control channel. Control channels can be assigned to any station without changing circuit boards or cables.				
Test Stations*	1 or 2		Up to 4 (6 if on/off HSMs)	Up to 8	Up to 8
Control Channels*	Up to 4	Up to 4	Up to 8	Up to 16	Up to 40
Conditioned Transducer Inputs*	Up to 12	Up to 12	Up to 24	Up to 40	Up to 80
Auxiliary Data Inputs* *Limitations may apply to realize capacities shown*	Up to 16	Up to 16	Up to 32	Up to 64	Up to 96
User Definable Digital I/O	3/3 included	3/3 included	16/16 available	16/16 available	32/32 available
Input on Voltage	2.7-26 VDC @ 0.5 maA minimum				
Input Resistance	2 K ohm				
Output	30V, 1A maximum				30 VDC, 2A maximum
Dimensions *(including enclosure)*					
Height	14 cm (5.5 in)		44.2 cm (17.4 in)	56 cm (22 in)	98 cm (38 in)
Width	43 cm (17 in)		21.6 cm (8.5 in)	37 cm (14.5 in)	60 cm (24 in)
Depth	44.5 cm (17.5 in)		64.8 cm (25.5 in)	66 cm (26 in)	90 cm (35 in)
Weight	8.6 kg (19 lb)		14 kg (31 lb)	45.4 kg (100 lb)	100 kg (220 lb)
Maximum System Update Rates	FlexTest 40: up to 6144 Hz		FlexTest 60: up to 8192 Hz	FlexTest 100: up to 8192 Hz	FlexTest 200: up to 8192 Hz
Power Input					
Voltage	Universal input: 100-240 VAC single-phase; 50-60 Hz				
Surge current (for 1/2 cycle)	< 40A		< 40A	< 80A	< 100A
Static current at 115 VAC	~ 4A		~8A	~12A	~16A
Static current at 230 VAC	~ 2A		~ 4A	~ 6A	~ 8A
Leakage current	< 3.5 mA		< 3.5 mA	< 3.5 mA	< 3.5 mA
Circuit protection	Short circuit protection by duty cycle fold-back with auto recovery				
Hydraulic Service Manifold I/F					
HSM contact outputs	1.0 A @ 24 VDC				
HSM proportional output	20 - 800 mA; 2 or 4 sec.			Only available with 493.74 board:	
	ramp on; 0, 2, or 4 sec.			20 - 800 mA; 2 or 4 second ramp on;	
	ramp off (selectable)			0, 2, or 4 second ramp off (selectable)	
Program Generation					
Frequency range	0.001 Hz to 600 Hz Recommend frequency not exceed 10% of system update rate.				
Resolution	32 bit				
Waveforms	Haversine, square, triangle, ramp, true sine, random, and sine-sweep				
Other	Broad band, frequency-weighted random signal generation Soft start-stop available on all functions				

	FlexTest 40	FlexTest 60	FlexTest 100	FlexTest 200
Valve Drive - 2 Stage	Dual-balance differential current source			
Output range	Adjustable full scale up to 100 mA. Compliance voltage = 20 V			
Output dither	Amplitude adjustable: 0-50% FS current. Frequency adjustable: 1-4915 Hz			
Valve Drive - 3 Stage	Dual-balance differential current source			
Output range	Adjustable full scale up to 100 mA. Compliance voltage = 20 V			
Output dither	Amplitude adjustable: 0-50% FS current. Frequency adjustable: 1-4915 Hz			
Excitation	Balanced output 100 mA maximum +/- 20 VAC, frequency set to 10 kHz			
Input	Differential AC-coupled with adjustable gain and zero			
Input-loop controller	Proportional and differential			
Digital Universal Conditioner	Primarily for resistive-type or reactive-type transducers			
Excitation	Balanced constant-voltage or constant-current, supports 4-wire or 8-wire connections			
DC excitation amplitude	1 - 20 V			
DC excitation accuracy	0.1% of Setting + 0.001 VDC			
AC excitation amplitude	2.5 -10 V peak-peak			
AC excitation accuracy	0.3% of Setting			
AC excitation frequency	Selectable: 10, 5, 2.5, 2, or 1 kHz			
DC gain range	1 - 20,000			
DC gain accuracy	0.1% of Reading + 0.001% of Range			
AC gain range	1 - 20			
AC gain accuracy	0.2% of Reading + 0.001% of Range			
TEDS support	Compatible with IEEE 1451.4 Class 2			
Analog Inputs (optional)				
Range	± 12.5 V			
Accuracy	0.1% of Reading + 0.0005 VDC			
Analog Outputs (optional)				
Range	± 10 V			
Accuracy	0.1% of Reading + 0.001 VDC			

System transducers can be calibrated to meet or exceed standards such as ASTM E4 and E83, ISO 9513 and 7500, BS 3846 and 1610, and DIN 51 301 and 51 307 to provide needed traceability.

For More Information or to Order

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