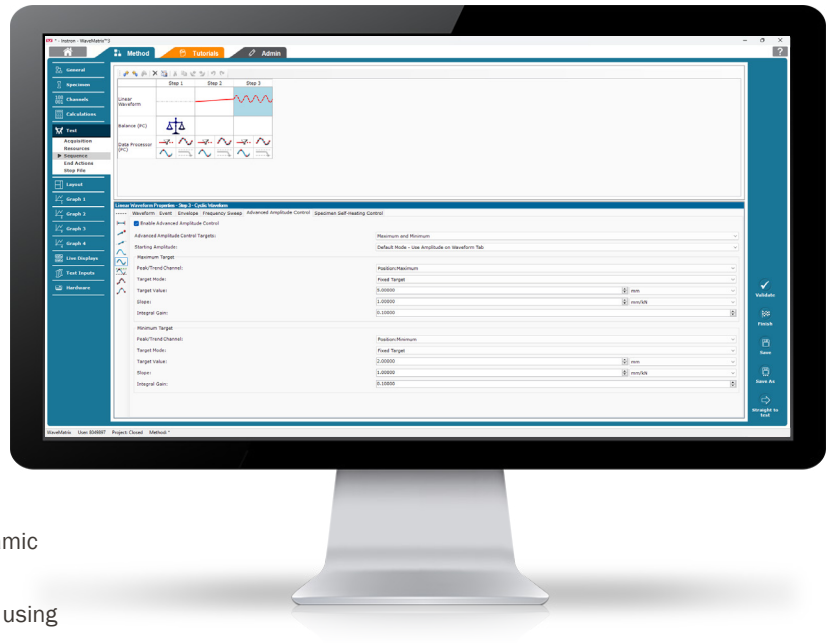
WAVEMATRIX™3 ADVANCED CONTROL

The Difference is Measurable

WaveMatrix can support additional modules that will enhance the standard capabilities of the original software.



The Advanced Control module introduces an increased range of control modes and waveform types which automatically adjusts the applied loading and can be used to:

- Solve challenging materials testing requirements with a versatile control suite.
- Control fatigue tests of non-linear, low-force materials using mixed-mode control.
- Perform outer-loop control using virtual channels created with 'Calculations Module', e.g. Cycle Energy.
- Execute a variety of frequency sweeps ideal for Dynamic Mechanical Analysis (DMA).
- Detect and correct for phase lag in cyclic waveforms using Automatic Phase Compensation.

SOFTWARE MODULE REQUIREMENTS

The Advanced Control Module can be easily added to an existing WaveMatrix license or a new system. If you are upgrading your software, Instron offer additional training to ensure that you will get the most out of the powerful new features.

SOFTWARE MODULE INTEGRATION

The features of the Advanced Control Module can be combined with the additional Calculations Module to amplify the overall capability of the software:

- Advanced amplitude control allows users to control waveforms based on calculated channels.
- Optimize test results by targeting peaks and trends of calculated channels (e.g. Max Cycle Energy).
- Ideal for use with DMA calculations, which are included with the Calculations Module.

FREQUENCY SWEEP

Working in harmony with the core WaveMatrix software, this module facilitates the ability to perform frequency sweeps within a single step to study frequency-dependent materials:

- Ramp up or down in test frequency, choosing to take either linear or octave steps in frequency.
- Option to use built-in hold back functions to ensure peak waveform targets are met.
- Compatible with all cyclic waveform types and control modes (Position, Load and Strain).

MIXED-MODE CONTROL

Optimize results by combining multiple control channels including any combination of control mode and target channel for specimens with non-linear or compliant properties:

- Improved waveform shape and peak accuracy with non-linear specimens and at low forces.
- Apply amplitude control techniques to sample data waveforms (e.g. impulse waveforms).
- Build complex test methods by combining mixed-mode control with calculated channels.

AUTOMATIC PHASE COMPENSATION

Automatic detection of the phase angle and phase lag corrections for cyclic waveforms allows the system to compensate:

- Removes effects of lag to ensure recorded cycles are correctly in-phase for calculation and comparison tasks.
- Ensures axial and torsional waveforms are accurately synchronized for biaxial fatigue tests.

INSTRON®

The difference is measurable®

SPECIFICATIONS

Feature	Description
Device Support	8800 (Servohydraulic and Electric Actuator) or ElectroPuls with the following version of firmware (or higher): 8800MT - V12.15.2677 or 8800T - V8.07.00
	1 or 2 Eurotherm (MODBUS) 2400, 2700, 3200, 3500 and K1S temperature controllers or 2400, 3200 and 3500 series temperature monitors[1]
	Instron Furnace Controller*[2]
	Instron Advanced Video Extensometer 2 (AVE2)*
	Instron XY-Stage*
	National Instruments DAQmx devices for additional Temperature and Voltage monitoring*
Security	PIN-Code Accessibility with 3-stage user defined access rights and unlimited user profiles
Control	Sine, triangle and square waves, trapezoids, holds, absolute/relative ramps, turning point and sample data playback
	Waveform Start and stop enveloping
	Amplitude control to correct for peak errors in a cyclic waveform
	Mixed mode control on cyclic waveforms
	Single and nested looping of steps
	Trend monitoring - control test flow based on relative or absolute changes in peaks or calculated per-cycle characteristics
	User defined events to control test progress
	Ability to pause and resume a test, either immediately or at some point in the future
	Control of digital and analogue outputs
	Capable of 1ms inter-block transfer time from one step in the sequence to the next
Data	Configurable data acquisition rate and re-sampling filter frequency (up to 10kHz)
	Advanced data reduction; using time, change in channel value, or simple points-per-cycle
	Data logging at independently configurable intervals for per cycle data (peak and trend) and full hysteresis data
	User-specified test and specimen inputs for dimensions and text, saved with the test record
	Test data output in ASCII text CSV format
	Automatic balance of extensometers and derived position channels at any stage of the test
	C# interface (advanced users only) for user-defined calculations during test
Live Test Space	Graphs and displays updated in real time while test is running
	Graphs for waveforms and hysteresis from raw and derived channels (X-Y, double-Y, multi-channel and chart recorder)
	Trend graphs for waveform peaks and calculated per-cycle characteristics throughout a step
	Configurable numeric displays for tracking data (transducer and derived channels), and cyclic peak and trend channels
	Customizable layout and content of test inputs, displays and graphs
Language	English, French, German, Chinese and Japanese

* Optional | [1] Each controller requires its own RS232 port | [2] Compatible with WaveMatrix V1.9.411 or later

MODULE OVERVIEW

Calculations

Use live calculations and process data in real-time to gather more insightful data quicker whilst reducing post-test processing time. Choose from an extensive library of 20+ built-in algorithms (such as cyclic energy, or dynamic modulus) or create your own.

Advanced Control

Use an increased range of control modes and waveform types which automatically adjust the applied loading. Combine with live calculations to create sophisticated adaptive tests.

Specimen Self-Heating Control

Specimen Self-Heating Control helps to accelerate test programmes for polymer composites where specimens generate heat internally under cyclic loading. Adaptively controlling frequency in response to specimen temperature reduces time for long life tests and improves consistency between stress levels.

CATALOGUE NUMBERS

New Orders	2495-945	Core Software
	2495-945D1	Calculations Module
	2495-945E1	Advanced Control Module
	2495-945F1	Specimen Self-Heating Control
Upgrade	2495-975B1	Core Software for Users without existing WaveMatrix Software
	2495-975B2	WaveMatrix3 Upgrade for existing WaveMatrix1 Users
	2495-975B3	WaveMatrix3 Upgrade for existing WaveMatrix2 Users
	2495-975D1	Calculations Module
	2495-975E1	Advanced Control Module
	2495-975F1	Specimen Self-Heating Control

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