MADC: MULTIAXIAL ADVANCED CONTROLLER

The MADC allows the user to easily define and execute a wide variety of complex tests and generate reports with obtained data. Its powerful hardware makes it possible to execute very complex control algorithms, deterministically, in real time. Thanks to the versatility of its software and hardware, MADC is able to accurately control virtually any system.

APPLICATIONS

- Quasistatic testing
- Pseudo-dynamic testing
- Dynamic testing
- Fatigue testing
- Modal testing
- Multiaxis shake table testing
- Motion simulation

KEY FEATURES

- Real time, deterministic control
- Modular design: 1, 2, 4, 6, 8, 10, 12, 14 or 16 simultaneously controlled axes.
- Embedded signal conditioning for feedback transducers: Load cell, LVDT, IEPE, etc.
- National Instruments® based hardware architecture.
- Control loop rate better than 4 (PXI based) or 15(FPGA based) kHz
- Controlled magnitudes: displacement, velocity, acceleration, load, strain.
- Advanced control algorithms:
  - Predictive PID (PPID)
  - Adaptive compensation of amplitude and phase (ACAP)
  - Hierarchical control loops (HCL)
  - Model inversion predictive control (MIPC)
  - Inverse and Direct Kinematics solution
  - Advanced decoupling features
  - System linearization through feedback
  - State Space control schemes
- Multistation feature

MADC 4 Channels

Embedded PXI Chassis and FPGA Controller

Applications

CE

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VZERO MADC SOFTWARE SUITE

- **RPD: Reference Profile Definition per Axis/DoF:**
  - · Basic waveforms: sine, square, etc.
  - · From ASCII file
  - · Time-magnitude pairs
  - · Swept sine and Random
  - · External (third party software)

- **TME: Test Management and Execution**
  - · Load and review of previously defined tests
  - · Real time tuning of control parameters
  - · Test execution management: run/stop test, pause, abort test. Data saving
  - · Waveform visualization: Reference and actual waveform in DoF/Actuator space
  - · Multistation feature

- **TDR: Test Data Review**
  - · Load and review test results from previously completed tests
  - · Calculated channels in Time and Frequency domains
  - · Basic reporting tools

- **RTC: Real time Control**
  - · Predictive PID (PPID)
  - · Adaptive compensation of amplitude and phase (ACAP)
  - · Hierarchic control loops (HCL)
  - · Model inversion predictive control (MIPC)
  - · Inverse and Direct Kinematics solution
  - · Dynamic control
  - · Advanced decoupling features
  - · System linearization through feedback
  - · State Space control schemes
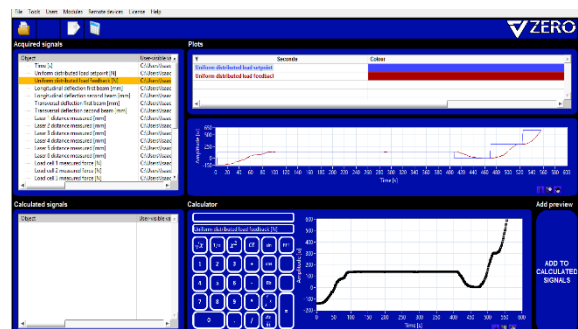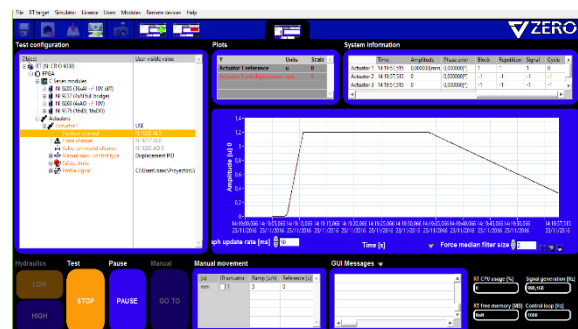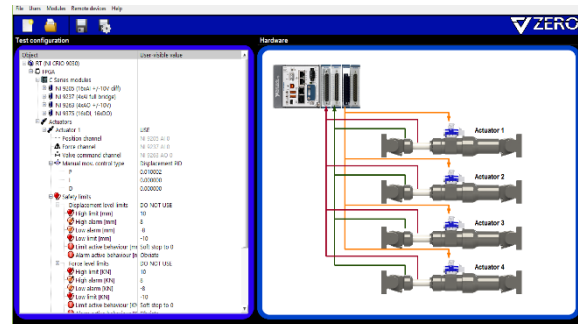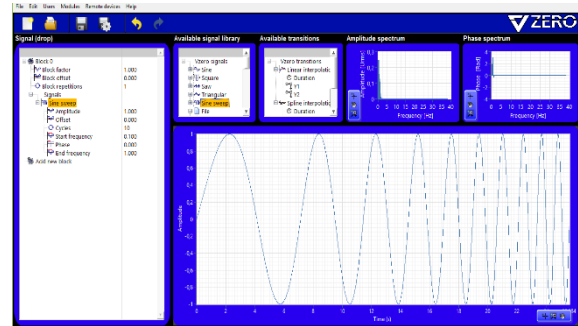
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