Overview

ServoEDGE is an integrated, multi-loop control and data acquisition system designed specifically for hydraulic and servo-hydraulic applications, including system modernizations, new installations, turnkey systems, and complete test cell control and data acquisition systems. The system is designed and pre-configured using both National Instruments (NI) PXI hardware and Wineman Technology’s integrated connector blocks and power module, which minimize cost and simplify connectivity and integration. The configured system provides a wide range of I/O capabilities for typical hydraulic applications; and since the system is based on off-the-shelf hardware, it can be easily modified to cover a wide range of I/O requirements.

Hardware

ServoEDGE is a real-time digital control and data acquisition system that uses the power of a multi-core embedded NI PXI real-time controller, ensuring both maximum performance and deterministic operation. Additionally, all the system’s I/O fits in a single 8-slot PXI chassis and leaves three slots available for future hardware expansion. All I/O connectivity from the PXI hardware is routed with standard cables to Wineman Technology’s connector blocks and power module. These modules provide the necessary signal conditioning, linear and switching power supplies, network hub and e-stop circuitry, and breakout all available I/O to standard screw terminals for easy connectivity to system sensors and control hardware. The system includes a standard PC, LCD monitor, keyboard, and mouse, and is housed in a single, full-height, 19-inch rack-mount enclosure. The enclosure comes complete with 4-inch castors, pullout keyboard tray, filtered ventilation port, and a monitor viewing and access panel.

Software

Based on the power and inherent features of NI VeriStand software along with Wineman Technology’s INERTIA™ add-on, ServoEDGE provides numerous feature enhancements specifically for hydraulic control and configuration including: simplified profile generation with custom procedure commands, PIDF tuning, amplitude control, custom control templates, integrated closed loop PID control with model execution, and multi-client support. In addition, other add-ons can be provided to further customize the system to meet your exact needs, including high-speed data acquisition, integrated support for sub-systems, or adding our vehicle model simulation application Dynaeur.

Features

- Expandable 4-axis test cell controller with up to 4 kHz digital PID loop closure
- Real-time, deterministic control and data acquisition for servo-hydraulics
- Multi-mode control
- Wide variety of I/O, displacement, strain gauge, thermocouple inputs, and numerous TTL and 24 VDC digital I/O
- 19-inch rack-mount enclosure with VeriStand and the INERTIA add-on preloaded and all channels configured
- Preloaded operator PC with VeriStand and INERTIA control software with custom procedure commands for simplified mode control and setup
- Easy connectivity to connector blocks makes wiring sensors easy
- Integrated network hub and e-stop circuitry
**HARDWARE SPECIFICATIONS**

**Closed Loop Control**

**Control Outputs**
- Number of Channels: 4
- Loop Rates: 4 kHz (adjustable)
- Output Drive: ±100 mA\(^1\), ±10 V or 4-20 mA
- Gain Parameters: Proportional, Integral, Derivative, Feedforward
- Amplitude Control

**Analog Inputs**

**Strain Inputs**
- Number of Channels: 8
- Modes: Full, half, and quarter bridge
- Resolution: 24-bit
- Range: ±100 mV or ±25 mV
- Excitation: 0.625 V to 10 V, 29 mA
- Filtering: Anti-alias at 0.45 Fs

**Thermocouple Inputs**
- Number of Channels: 4
- Resolution: 24-bit
- Range: ±80 mV
- TC Types: J, K, T, E, N, B, R, S
- Input Bandwidth: 14 Hz to 67 Hz

**LVDT**
- Number of Channels: 4
- Resolution: 16-bit
- Range: ±16 mV/V to ±2500 mV/V
- Excitation: 3.27, 5.0, or 10 kHz, 3 Vrms
- Filtering: 0.2, 2, 20, or 2000 Hz

**General Voltage Inputs**
- Number of Channels: 8 single-ended or 8 differential
- Resolution: 16-bit
- Modes: Voltage or Current (jumper selectable)
- Range: ±10 V or ±20 mA

**Digital I/O**

**24 VDC Digital Inputs**
- Number of Channels: 32\(^2\)
- Range: 24 VDC
- Input Current: 12 mA typ.

\*Specifications subject to change without notice.
\(^1\) Pre-wired for ±100 mA but could be ±10 V or ±4-20 mA.
\(^2\) Three are used for internal functions.
TTL Digital Inputs
  Number of Channels: 4
  Range: TTL
  Input Current: 250 µA typ.

TTL Digital Outputs
  Number of Channels: 4
  Range: TTL
  Output Current: 16 mA typ.

Relay Outputs
  Number of Channels: 32
  Type: SPST, Form A
  Voltage Rating: 30 VDC
  Current Rating: 1.85 A @ 30 VDC

Physical
Environment
  Operating Temperature: 0° to 40° C
  Storage Temperature: 0° to 40° C
  Operating Humidity: 10 to 90% RH, noncondensing
  Storage Humidity: 5 to 95% RH, noncondensing

Power Requirements
  Input Voltage: 120 VAC
  Power Consumption: TBD Watts typical

3 One is used for internal functions.