

ServoEDGE

Servo-Hydraulic Controller with *INERTIA*

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 Dynacar.

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
- Multitude 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	$\pm 100 \text{ mA}^1$, $\pm 10 \text{ V}$ 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	$\pm 100 \text{ mV}$ or $\pm 25 \text{ mV}$
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	$\pm 80 \text{ mV}$
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	$\pm 16 \text{ mV/V}$ to $\pm 2500 \text{ mV/V}$
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	$\pm 10 \text{ V}$ or $\pm 20 \text{ mA}$

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 $\pm 100 \text{ mA}$ but could be $\pm 10 \text{ V}$ or $\pm 4\text{-}20 \text{ mA}$.

² Three are used for internal functions.

TTL Digital Inputs

Number of Channels	4
Range	TTL
Input Current	250 uA typ.

TTL Digital Outputs

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

Relay Outputs

Number of Channels	3 ²
Type	SPST, Form A
Voltage Rating	30 VDC
Current Rating	1.85A @ 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.