Overview
DynEDGE is an integrated, multi-loop control and data acquisition system designed for dynamometer 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 dynamometer application; and since the system is based on off-the-shelf hardware, it can easily be modified to cover a wide range of I/O requirements.

Hardware
DynEDGE 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, DynEDGE provides numerous feature enhancements specifically for dynamometer control and configuration including: simplified profile generation with custom procedure commands, PIDF tuning, 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 Dynaear.

Features
- Expandable 4-axis test cell controller with up to 4 kHz digital PID loop closure
- Real-time, deterministic control and data acquisition for dynamometers
- Wide variety of I/O, including frequency, encoder, 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: 100 Hz to 2 kHz (user selectable)
- Output Drive: ±10 VDC or 4-20 mA (jumper selectable)
- Gain Parameters: Proportional, Integral, Derivative, Feedforward

**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

**Frequency Inputs**
- Number of Channels: 2
- Voltages Range: 50 mV to 250 V
- Full Scale Frequency Ranges: 200 Hz to 400 kHz
- Excitation: 10 VDC up to 70 mA
- Filtering:
  - 0.2, 2, 20, 200 or 2000 Hz

**Encoder Inputs**
- Number of Channels: 2
- Voltages Range: 5 VDC (TTL)
- Maximum Frequency Response: 1 MHz
- Excitation: 5 VDC up to 300 mA

**Thermocouple Inputs**
- Number of Channels: 32
- Resolution: 24-bit
- Range: ±80 mV
- TC Types: J, K, T, E, N, B, R, S
- Input Bandwidth: 14 Hz to 67 Hz

**General Voltage Inputs**
- Number of Channels: 30 single-ended or 14 differential
- Resolution: 16-bit
- Modes: Voltage or Current (jumper selectable)
- Range: ±10 V or ±20 mA

*Specifications subject to change without notice.*
### Digital I/O

#### 24 VDC Digital Inputs
- **Number of Channels**: 32
- **Range**: 24 VDC
- **Input Current**: 12 mA typ.

#### 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**: 32
- **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

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1 Three digital inputs and one digital output come prewired to internal signals.