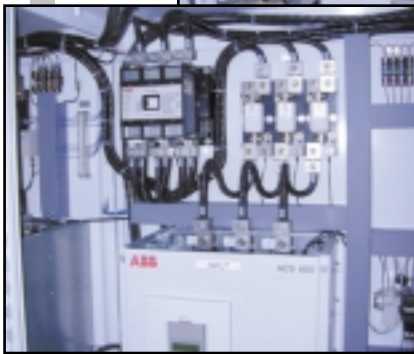


CASE STUDY

DYNAMOMETER CONTROL SYSTEM

Operator Configurable Profiles with Data Acquisition



Overview The Michigan division of a large automotive powertrain components manufacturer needed a dynamometer control system that incorporated three different operator configurable control loops for torque converter research and development. They also wanted 32 channels of data acquisition at a 200 Hz sampling rate as well as the ability to regulate torque, flow and temperature characteristics of torque converters attached to the dynamometer. When it came to the hydraulic system, the customer requested a smooth operation of the valves at contamination levels as high as 40 microns.

Solution Develop an intuitive and multifunctional control dynamometer test system including motors, drives, control data acquisition package and control software. This solution, formed by Galco's engineering department, integrates with the valves, dynamometer bases, feedback transducers, and hydraulic package provided by a third party. The transducers provide pressure, flow, RPM, temperature, and current feedback to the system. Completing the project installation are two 125 HP 1750/5000 RPM liquid cooled motors along with two model ACS600 vector drives from ABB. Each drive is configured for common buss operation. Galco's solution uses Dataq® data acquisition and analysis software in conjunction with HMI and IEC 1131 control software and allows the customer to conduct research and development on torque converters for approximately 1/10 the cost of the previous version.

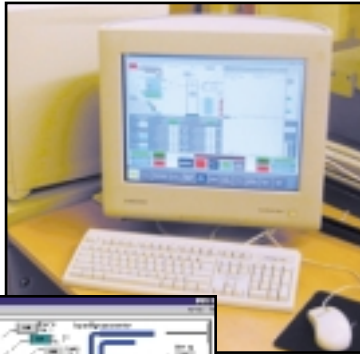
INDUSTRIES

- Automotive
- Development
- Electric Motors

APPLICATIONS

- Torque Converters
- Clutch Testing
- Transmission Testing

CASE STUDY



Operation The test operator can configure four valves with either an automatic or manual setpoint. They also have the ability to configure each valve to regulate the torque, flow, or temperature associated with the test article.

There are 25 user configurable profile steps providing a means of generating speed and torque sweeps while in automatic mode. The operator can repeat each profile up to 100,000 times for durability studies or link a profile to any of the other 25 profiles. Information is transmitted between the operator station and drives via a Profibus fieldbus connection. Torque, speed, flow, pressure, and temperature are recorded and displayed using 32 isolated channels of data acquisition.

Each data acquisition channel has a warning and fault limit associated with it. If the fault limit exceeds its preset, the test process ceases and the dynamometers decelerate to a controlled stop. Warning limits prompt the operator of problems that the software senses in the test.

The entire process provides simple or elaborate testing depending on the customer's needs. The automatic mode lets the operator run the profile or disable setpoints at will. The facilities screen provides the operator with control of the dynamometer cooling water, hydraulic pump, spindle lube and test head sump. Using the manual mode of operation allows the operator control of speed, direction, acceleration and deceleration of the two dynamometers. Data is logged onto the PC's hard drive at intervals specified by the profile generator or manual "snap-shot" pushbutton while operating in manual mode.

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