

Drive-by-Wire Testing Using ADwin Systems

Real-Time Data Collection for Analog, Digital and CANbus Applications

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In the automotive industry, **Drive-by-wire** (AKA **X-by-wire**) technology has replaced many traditional mechanical control systems with electronic and electro-mechanical control systems including brake-by-wire and electronic throttle control. This has resulted in improved safety and ergonomic designs along with more options in commercial cars. Drive-by-wire systems require rigorous testing and data collection, and for these applications

CAS DataLoggers offers [**ADwin Real-Time Data Acquisition Systems**](#). German manufacturer Jager-ADwin's systems log

signals from Analog and Digital sensors along with CANbus

interfaces—all in real time. For more information call **CAS DataLoggers** at **(800) 956-4437** today.



Drive-By-Wire Technology in Today's Cars:

Modern automotive mechatronic systems employ a complex network of sensors to quickly determine the driver's intention and to continually check system conditions. Increasingly, automotive designs use contactless sensor solutions to increase both the reliability and availability of mechatronic systems. The inductive measuring principle has proven to be highly suitable for this type of data collection application.

Here position sensors are of central importance. With this sensor technology, the momentary position of accelerators, throttles, leveling systems or turbochargers are reliably determined, all while undergoing demanding industrial environmental test conditions.

Analog, Digital, or CAN--ADwin Keeps Overwatch

The use of the various signal outputs provided by these position sensors depends on the specific measurement task or on the specific manufacturer. For example, data can be collected from:

- Analog signals (ratiometric, current, voltage)
- Digital signals (PWM)
- CAN bus interfaces

The synchronicity of the data on all these outputs and interfaces is a key criteria in automotive production and development. To accomplish this, many users employ [ADwin data acquisition and control systems](#) which are expressly designed for automotive applications.

As a common example in a test environment, **ADwin** controls a **stepping motor** for the set point positioning and simultaneously acquires the **reference position** by an incremental encoder along with all signal outputs of the sensor under test. As an example, ADwin evaluates the time relation between the arrival of a CAN message, an analog signal output, and the reference position value, and then checks for compliance with the specified values. Thus the system can immediately calculate how well the DUT matches the required specifications.



ADwin: Real-Time Data Acquisition:

ADwin benefits:

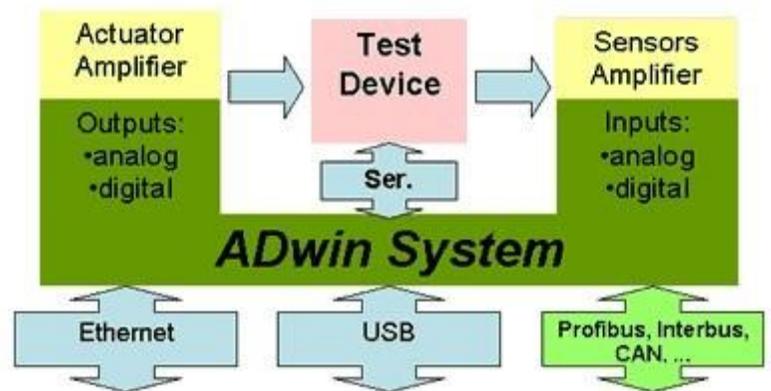
- High-speed data acquisition can measure transients
- Easy to use

- Quick development time
- **ADwin** systems can be configured individually in order to meet all test specifications.

[ADwin data acquisition and control systems](#) are commonly used for automotive test applications for ECUs and other CANbus devices, for actuators, sensors, combustion engines, field bus systems, and many more.

[ADwin-light-16](#) and [ADwin-Gold](#) systems are low-cost solutions for applications with few I/O channels and limited expansion or configuration requirements. In contrast, the modular and expandable [ADwin-Pro](#) system is recommended for applications with many channels and flexible configurations.

ADwin applications always run in real time. ADwin's strictly deterministic functioning principle with response times as short as **300 ns** ensures that no information gets lost in testing of X-By-Wire components. This is due to the system design which incorporates a local CPU, additional analog and digital interfaces, and expansion options.



Data Analysis:

The PC can access the results on the ADwin system for further analysis and data logging. Since programming in ADbasic is simplified, users quickly gain a clear insight into their components under test. ADwin's external SDRAM stores the recorded post-test data which has significant value to:

- ECU Manufacturers
- Systems integrators
- 3rd-party Testers

ADwin systems perform all the necessary tests and also perform post-test data analysis. Test information and measurement data is transferred to a control system and displayed on the PC

through a graphical user interface (GUI). This is done via Ethernet or a Fieldbus interface. On production lines, a programmable controller is typically connected via **Profibus, Interbus, CAN,** serial interfaces etc. The ADwin automatically generates a table of the data and this information can then be stored as quality records in the production database.

ADwin creates the transparency you need for clear quality statements.

For more information on [ADwin Real-Time DAQ & Control Systems](#), or to find the ideal solution for your application-specific needs, contact a **CAS Data Logger Applications Specialist** at **(800) 956-4437** or visit our website at www.DataLoggerInc.com.

Contact Information:
CAS DataLoggers, Inc.
8437 Mayfield Rd.
Chesterland, Ohio 44026
(440) 729-2570
(800) 956-4437
sales@dataloggerinc.com
www.dataloggerinc.com