

Application Note

Comprehensive evaluation of vehicle systems using real signals

Industry: Automotive

ScopeCorder DL950



ScopeCorder DL950

Summary

In recent years, as electric vehicles have become more electrically-driven and intelligent, their control systems have become more complex, and the overall evaluation of vehicle systems has become increasingly difficult.

Subsystems controlled by ECU, including electric motors, batteries, driving support functions such as ADAS/AD, steering and anti-lock brakes, and safety devices such as airbags and seatbelts, are networked by in-vehicle serial buses such as CAN FD. Another important evaluation item is the improvement of ride comfort with reduced noise and vibration.

The comprehensive evaluation of vehicle systems on test benches, test courses and public roads covers a wide range of items, and it is impossible to conduct repeated experiments. Therefore, it is important that in-vehicle serial bus data and analog signals can be recorded simultaneously, that raw data can be recorded for a long time and analyzed later, and that multiple items can be measured reliably even under noise.

The DL950 is a newly designed ScopeCorder that significantly enhances the functionality and performance of the DL850 series, which has been well received in the automotive industry.

Points

■ Isolated max. 1000V input

In waveform measurement of high voltage or large current, there is a possibility of short circuit, electric shock accident or damage of the measuring instrument caused by insulation failure, wrong wiring, over-input, etc. In order to prevent such accidents, it is important that the measuring instrument has an isolated input. The ScopeCorder series, including the DL950, offers a variety of isolated input modules, including up to 1000 V input modules.

■ 32 channels, up to 160 channels

Voltage and current of various motors and control systems, motor rotation speed, battery voltage fluctuation, vibration, noise, temperature, strain, etc. may be measured simultaneously. The DL950 has a maximum of 32 channels, and up to 160 channels with 5 units synchronization.

■ 200 MS/s sampling and multiple samples

High-speed sampling is required to understand sudden voltage fluctuations in inverters and batteries. The DL950 is capable of sampling up to 200 MS/s. You can also set a different sample rate for each channel, reducing the amount of data combined with slower sample channels such as temperature.

■ Trend display of in-vehicle serial bus

CAN /CAN FD /LIN /SENT in-vehicle serial bus data can be displayed by trend. For example, vehicle speed data on CAN FD can be measured simultaneously with sensor outputs such as voltage and current of motor drive, motor speed, temperature and vibration.

■ Large memory & internal SSD, PC streaming

Using 8 G points memory and a 512 GB internal SSD, you can record your data for extended periods of time. Flash acquisition is also available for even higher sampling rate recording.

Coupled with IS8000 integrated software, the system can record real-time and long periods of time on PC storage via 10 Gbps Ethernet (/C60 option).

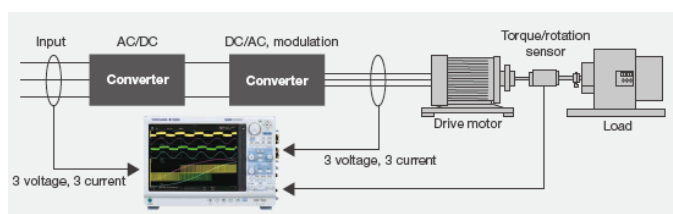
Features

■ 12.1-inch touch screen & high noise resistance

Intuitive touch with the 12.1-inch XGA touch screen. It is also designed to operate normally in noisy environments near the inverter. If the touch screen malfunctions, turn off the touch screen and use the hard key and jog dial to operate all functions.

■ Evaluation of motor and inverter

Using the power analysis function (/G05 Option), the power and conversion efficiency can be calculated and displayed in real time from the inverter input/output voltage and current as well as the motor rotation speed and torque. The effect of harmonics due to disturbance can also be analyzed.



The IS8000 integrated software synchronizes the DL950 with the accurate WT5000 for rigorous motor inverter evaluation.

■ Evaluation of electric power steering

Using the real-time calculation function (/G03 Option), the torque and steering angle can be calculated in real time from the signals of the torque sensor and resolver of the electric power steering and displayed simultaneously with the drive current of the assist motor and the vehicle speed signal on the on-board serial bus.

■ Evaluation of airbags and seatbelts

The sensor output and control signal of the airbag or seat belt from the impact input of the collision can be continuously recorded at a maximum sampling rate of 200 MS/s.

The IS8000 integrated software enables high-speed camera video and recorded waveform data to be played back simultaneously. This allows you to analyze the correlation between physical conditions and electrical signals.

■ Verification of ECU control and the behavior

It is an important evaluation item to compare and verify the actual behavior of the controlled object with the control data calculated by the control software of the ECU used in various parts of the automobile.

The DL950 can display waveform of various signals as well as in-vehicle serial bus data such as CAN /CAN FD /LIN /SENT by trend.

■ Endurance test

In a long endurance test, if all signals are sampled at high speed, the amount of data will be enormous. The dual capture feature allows fast sampling to catch sudden transients while slow sampling keeps track of trend.

■ Driving test

Connect the GPS unit of the accessory and record the time and location information together with the measurement data.

With the software DIAdem, it is possible to simultaneously display the measurement data and the drive trace data on the map. If you only want to view the drive trace data, you can also use Google Earth Pro.



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