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Leaflet

High-Speed Data Acquisition Unit SL2000 ~ Advanced Metrology ~

The SL2000 is a high-speed data acquisition system that combines the functionality of an isolated oscilloscope. It offers two operating modes: Scope mode for long-memory isolated oscilloscope functionality, and Memory Recorder mode for high-speed data acquisition. Its features and performance are equivalent to those of the DL950 model with a display.

Advanced Metrology 1 High-speed sampling, High resolution, Long-term recording, Multiple channels

Challenges

- Oscilloscopes often fall short in record length and channel count.
- Data recorders typically have limited sampling rate.

Solutions

- Sampling : Max. 200 MS/s (5 ns intervals)
- Resolution : 12/14/16 bit
- Record length : Max. 50 days
- Channels : Max. 160 CH (5-unit sync.)

SL2000

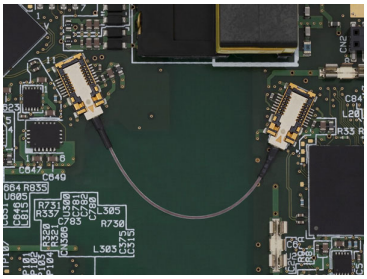
Advanced Metrology 2 Safe measurement with isolated inputs and superior noise immunity

Challenges

- Risk of oscilloscope damage from incorrect connections.
- Avoiding the use of expensive differential probes.
- Measurement instruments malfunctioning due to noise sources such as inverters.

Solutions

- Up to 1000 V input (using passive probes)
- Isolated inputs reduces the risk of equipment damage and electric shock
- Up to 7000 V input (using differential probes)
- Noise-resistant design



High-Speed Isolation Technology “isoPRO”

The input circuit and the signal processing circuit are connected via optical fiber, achieving isolation, high-speed sampling, and superior noise immunity.
Installed modules: 720211, 720212

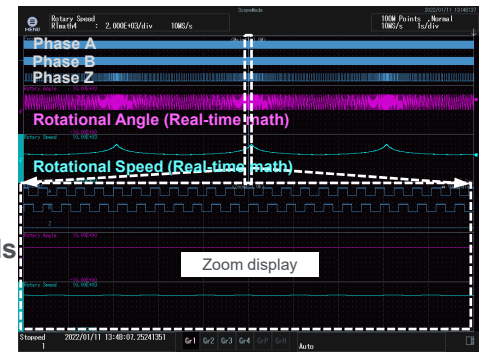
Advanced Metrology 3 Simultaneous measurement of electrical signals and physical quantities, with real-time unit conversion

Challenges

- Measuring physical quantities, such as temperature and vibration, simultaneously with voltage and current.
- Viewing actual response to ECU command values as trend waveforms.
- Requiring real-time unit conversion of outputs from rotation sensors and torque meters.

Solutions

- Simultaneous measurement of voltage, current, temperature, vibration, strain, frequency, and logic signals
- Display CAN, CAN FD, LIN, and SENT data as trend waveforms simultaneously
- Real-time math to convert data into parameters such as rotational angle and torque instantly
- Triggering based on calculated values is also supported.



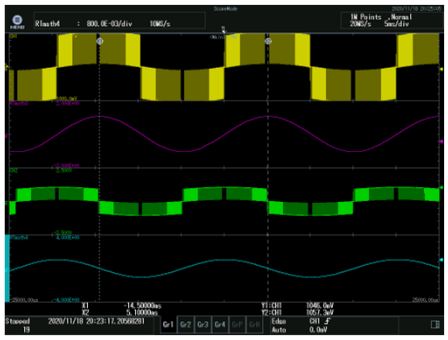
Example: Calculating rotational angle and rotational speed from encoder signals

Real-Time Math, Power Math, Motor dq Analysis

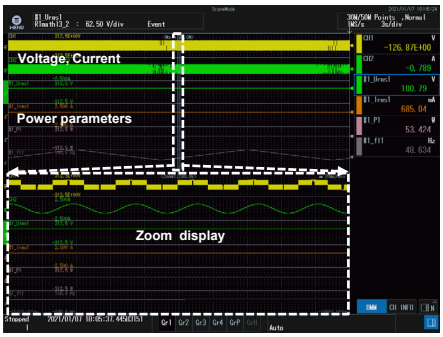
- Real-time math (/G03 option)
  - Perform pre-configured calculations on acquired signals
  - Display results as real-time trends
- Power math (/G05 option)
  - Compute various power parameters and conversion efficiency, and perform harmonic analysis up to the 40th order

  (Includes /G03 function)
- Motor dq analysis (/MT1 option)
  - Execute Park and Clarke transformations internally using battery DC voltage/current, three-phase motor voltage/current, and rotational data
  - Calculate and trend-display in real time Id, Iq, Vd, Vq, motor power, and more

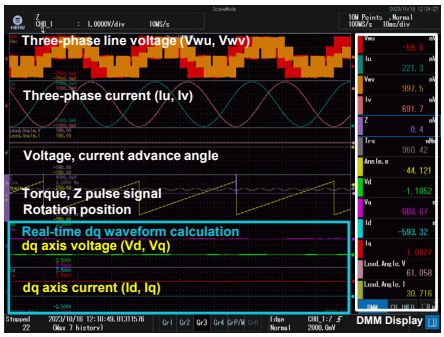
  (Includes /G05 function)



Example: PWM signal demodulation



Example: Power math

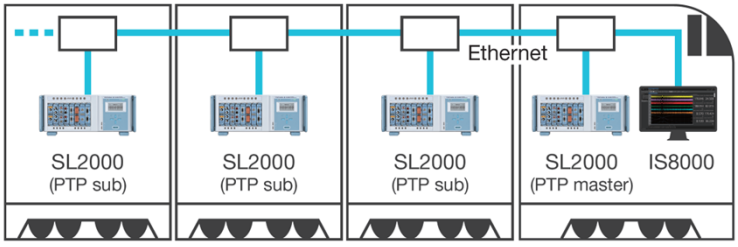


Example: Motor dq analysis

Example: Railway vehicle performance test

SL2000 can simultaneously record a wide range of electrical signals and physical quantities, including the voltage, current, and rotational speed of railway vehicle batteries, inverters, and drive motors, as well as vibration, strain, and noise from the car body, and temperatures at various locations inside the vehicle.

- Simultaneous measurement at two or more remote locations
- Synchronization accuracy of ±150 ns (typ.) when using the /C40 option
- Distributed synchronous measurement of up to 160 channels
- Simultaneous recording of power supply voltage and current, as well as strain and sound (using microphones or sound level meters with voltage output)
- Power efficiency evaluation enabled by the power calculation function (/G05 option)



Required Modules, Accessories, and Functions

- Voltage, Temperature, and Acceleration Modules (e.g., 720256, 701265, 701275)
- IEEE1588 Master Function (/C40 option)
- Multi-unit synchronization Interface (/C50 option)
- Power math function (/G05 option)

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