Signal.X
TECHNOLOGIES LLC

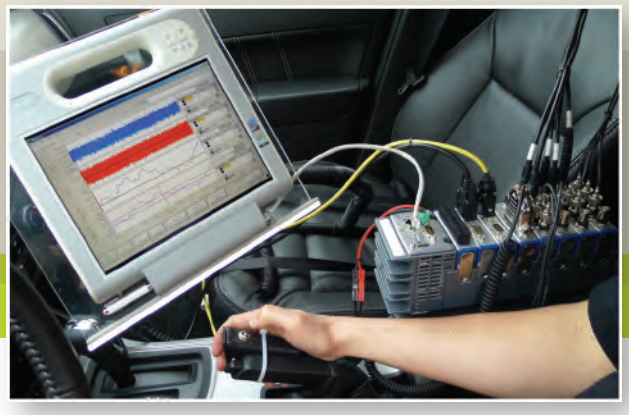
SWORD™

High Performance Mixed-signal Data Acquisition for use with National Instruments CompactRIO™

CAN | Temperature | Voltage | Strain | Digital | Frequency | Current | Vibration | Sound

NATIONAL INSTRUMENTS™
Certified Alliance Partner

For demanding customers in demanding environments.



SWORD™

Sword provides sophisticated datalogging features using the rugged CompactRIO™ hardware platform from National Instruments Corporation. A selection of over fifty different signal conditioning and communication modules means that we can offer a variety of channel configurations to meet almost any test requirement. With Sword's intuitive setup features, you can quickly define event-based datalogging tasks include complex trigger logic and a mix of analog and digital signals, temperature, strain frequency inputs and even raw or filtered CAN bus traffic.

Key features include:

- Intuitive file system hierarchy with manual or automated run sequencing
- Channel assignment by modules to application specific sample rate groups
- Channel synchronization to microsecond accuracy (module dependent) independent of group and rate
- Flexible triggering with pre and post trigger buffers, multi-channel combinations and Boolean logic
- Use interactively or headless (disconnected from computer) for rugged or space-limited tasks
- Large on-board memory with external drive option provides long record times

PRE-DEFINED AND CUSTOM CHANNEL CONFIGURATIONS

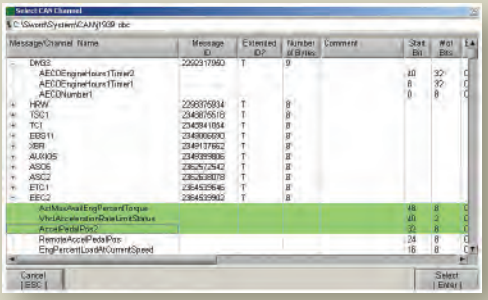
Sword offers easy access to the many different signal conditioning modules available in National Instruments' C-series architecture. Customers can select from one of our pre-defined channel layouts, or specify a custom configuration. We carefully optimize the performance of each configuration to account for the unique characteristics of each module. This way, a user can rearrange their modules into any of the available configurations, and with a simple selection in the software; Sword takes care of the rest.

Pre-defined configurations (call for latest additions):

- Base: 16 analog, 2 CAN ports, 6 digital, 4 strain, 12 thermocouples
- Base Plus:16 analog, 2 CAN ports, 6 digital, 4 strain, 16 thermocouples
- Ride/NVH: 16 accels, 4 CAN ports, 6 digital
- Mixed: 16 analog, 8 accels, 6 digital, 8 strain, 16 thermocouples

CHANNEL GROUPING AND SYNCHRONIZATION

Sword allows you to organize a diverse complement of signals into user-defined sample rate groups. The channels from one or more signal conditioning modules are assigned to groups that are differentiated by sample rate and optimized for synchronized sampling and trigger timing.



Sword configurations with Controller Area Network (CAN) capability will support multiple high and low speed buses at up to 1Mbs baud rates. Users have the option of viewing unmodified CAN traffic, and/or filtering CAN message streams (with a *.dbc file, *.ncd file, or equivalent mask) and automatically converting them to channel data where they are assigned to their own channel group. This makes synchronized CAN data available for triggering and visualization alongside other channel groups.

ADVANCED DATALOGGING CAPABILITY

Headless operation

- Configure Sword over Ethernet from a Laptop and disconnect for headless operation. When data collection is complete, reconnect to the Laptop for automatic synchronization and review of data files.

- In fleet deployments, the Sword synchronization strategy offers exceptional flexibility and efficiency by allowing the Sword PC application to synchronize configuration files and data with any Sword data acquisition unit. The fleet operator can establish a single collection site, or distribute Sword hardware appropriate to the task while allowing users to maintain their own PC application.

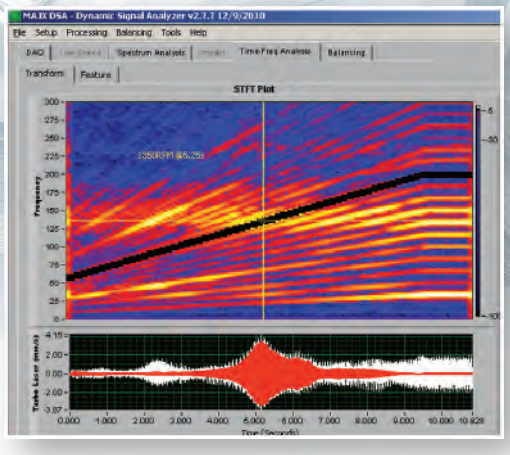
- When headless operation requires operator interaction, Sword offers an optional heads-up display that provides real-time status information, one or two live data displays and selectable user controls

Scalability

From a single PC, coordinate triggering and data collection between multiple Sword acquisition systems over Ethernet to attain high channel count data acquisition.

Compatibility

Sword data files use the Technical Data Management Streaming (TDMS) format. Files can be exported to 3rd party formats such as Uff-58, wave and text. TDMS files are compatible with our NVH analysis tool, MajX-DSA™, offering a seamless access to typical dynamic analysis such as power spectra, order analysis, order cuts, time/frequency analysis, and even SPL and Zwicker Loudness when a microphone is present in the system.



SPECIFICATIONS

Environmental:

Operating Temperature: -40 to 70 deg C.

Operating Vibration:	Random (IEC 60068-2-64):	5 g RMS, 10 to 500 Hz
	Sinusoidal (IEC 60068-2-6):	5 g , 10 to 500 Hz
Operating Shock:	30 g, 11ms half sine, 50 g, 3 ms half sine	

CUSTOM DESIGNED ENCLOSURES AVAILABLE UPON REQUEST.

Power Consumption: ~35W maximum, ~20W typical. Dual power supply inputs 9-35V DC.

General:

Sample Rates: Dependant on module selection, from 1 Hz to 100 KHz.
3 sample rate groups available, all synchronized and combined into one file.

File Format: TDMS format. Easily imported into DIAdem, Excel, Matlab or other analysis routines.
Storage can be either on the internal drive or to an external USB drive for extended duration missions.

CAN: Specified by either a *.dbc or *.ncd file and converted to engineering units and re-sampled to a rate synchronous with analog signals for easy viewing. In addition, select "Listen All" and receive all CAN traffic as a bus monitor tool.

Triggering: Arm, start and stop triggers can be separately defined. Options for time based, software based, external switch, or Boolean combination of up to two defined channels are available. Pre and post-trigger buffers are easily defined.

Example Configurations:

BASE:
- 16 channels analog input – 16 bit resolution, +/-10V to +/-200 mV up to 1000 Hz
- 2 CAN ports – full bus load at up to 1 Mbps
- 6 channels digital input – general state information or tachometer
- 4 channels strain input – 1/4, 1/2 or full bridge with selectable excitation
- 12 channels thermocouple input – 1 or 2 Hz supporting multiple types of thermocouples

BASE PLUS:
- 16 channels analog input – 16 bit resolution, +/-10V to +/-200 mV up to 5000 Hz
- 2 CAN ports – full bus load at up to 1 Mbps
- 6 channels digital input – general state information or tachometer
- 4 channels strain input – 1/4, 1/2 or full bridge with selectable excitation
- 16 channels thermocouple input – 1 or 2 Hz supporting multiple types of thermocouples

RIDE/NVH:
- 16 channels IEPE input – 24 bit, SW selectable AC or DC coupling from 64 Hz to 51.2 KHz
- 4 CAN ports – full bus load at up to 1 Mbps
- 16 channels thermocouple input – 1 or 2 Hz supporting multiple types of thermocouples

MIXED:
- 16 channels analog input – 16 bit resolution, +/-10V to +/-200 mV up to 5000 Hz
- 6 channels digital input – general state information or tachometer
- 8 channels strain input – 1/4 bridge with built-in excitation
- 16 channels thermocouple input – 1 or 2 Hz supporting multiple types of thermocouples
- 8 channels IEPE input – 24 bit, SW selectable AC or DC coupling from 64 Hz to 51.2 KHz

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Signal.X Technologies LLC is a National Instruments Certified Alliance Partner located in Southeast Michigan. Our team of certified LabVIEW™ developers specializes in applying National Instruments hardware and software to a diverse range of applications in manufacturing test, product development, field data acquisition and NVH. To learn more, visit our website at www.signalxtech.com. We invite you to call us or request a web presentation where we can further discuss your requirements.