SIGMA

High Resolution Transient Scope

- **Up to 8 input channels**
- **Up to 0.25% accuracy at probe tip — the best available at any price!**
- **Mix and match sample rates and resolutions**
- **Differential input mode**
- **Full featured integrated Windows PC with USB and Ethernet**
- **Sophisticated range of real-time measurements including custom analysis**
- **Direct support for a wide range of third party analysis packages – even running on the Sigma!**
- **Application Library provides full DCOM customization capabilities**
- **High resolution 10.4" touchscreen display**
- **Intelliprobe™ interface seamlessly integrates differential input, probe ID, scaling and probe power**
- **Optional streaming to disk mode**
- **Optional dual independent monitor mode**
- **Optional Synchroscope® Module enables rotational measurements**

SIGMA TRANSIENT OSCILLOSCOPE

From the company that invented the DSO comes a new breakthrough in performance. The Sigma series offers unsurpassed acquisition, analysis and display capabilities in a compact, easy to use form factor.

Setting new performance standards, the Sigma series integrates high accuracy signal acquisition, extensive analysis capabilities and a full featured Windows PC in an affordable family of products. Whether it's the 12-bit high resolution Sigma 30, the 8-bit Sigma 60 or 75, the mixed mode Sigma 90 or even the high speed/resolution Sigma 100, LDS-Nicolet offers capabilities normally reserved for high end Digital Oscilloscopes.

SIGMA EXAMPLE APPLICATIONS

Reduce Ignitor Testing Time with Automation
Sigma helps reduce testing time by easily taking you from ignitor data collection to report generation. Pressure rise and decay times can be calculated automatically and posted to Excel or other analysis programs for a complete table of results and/or custom reports. Data can also be automatically saved to disk, printed, or emailed for each test using DataSentry™.

High Voltage/Impulse Testing
Sigma 100HV is the only scope that meets the demanding performance of a reference digitizer in IEC 610-1-Ed. 2.0 and offers IEC 61083-2 compliant lighting impulse analysis software. Automatically measure all standard IEEE 4/IEC 60060-1 parameters in one compact instrument at the fraction of the cost of competitive systems. The Sigma 100HV also incorporates an enhanced magnetically shielded RF enclosure built to withstand extreme electrical and magnetic fields.

Sigma is a digital oscilloscope workstation with a full featured Windows PC

LDS
NICOLET

Packaging and Design

The Complete Solution

Sigma's architectural approach capitalizes on the capabilities of a high-end PC while maintaining an uncompromising concern for transient scope performance. Unlike traditional PC-based acquisition systems which are forced to support PC components with unknown capabilities, Sigma's CPU and graphics have been designed from the ground up to optimize processing speed and screen update performance. Additional consideration has also been given to ensure PC and peripherals minimize degradation of overall system accuracies. Add this attention to detail to the familiar Windows Desktop, and you have a complete solution for both measurement and analysis in a single, affordable system.

Simplicity By Design

Compact and rugged, the Sigma is a streamlined "bookshelf" design, maximizing display and front panel space yet minimizing the impact on valuable bench space. Traditional front panel controls provide a comfortable look and feel.

The integrated touch screen provides direct access to all oscilloscope functions including acquisition, analysis and setup.

There is no need for a mouse or keyboard to operate the system, including advanced functions. But the mouse and keyboard provide yet another method of control for the ultimate in flexibility. Whether using the touchscreen, mouse or the front panel controls, the user interface is the same! No need to learn a different user interface for different modes of operation.
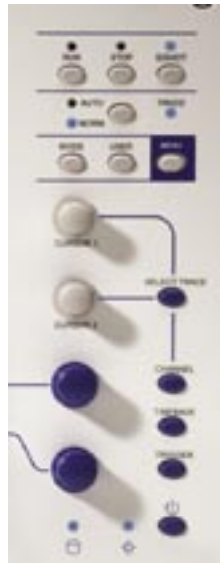
Differential Inputs And More

Differential inputs offer great benefits over single-ended inputs including:

- Elimination of ground loop errors

- Reduction of noise pickup in long cables

- Direct measurement of floating circuits

- Safe phase to phase power measurements

Sigma offers a variety of differential measurement options:

- For the highest possible performance, Sigma incorporates the IntelliProbe interface offering better than 0.1% accuracy at the probe tip, plus high CMRR and high voltage differential probes. The IntelliProbe family even includes a current probe and all seamlessly integrate probe identification, scaling and probe power for worry free operation.

- For routine applications that don't require such extreme performance, the Sigma 30, 75, 90, and 100 models offer high accuracy front end amplifiers that allow you to make a quick and accurate differential measurement. A convenient differential menu selection enables you to use two channels to make a differential measurement.
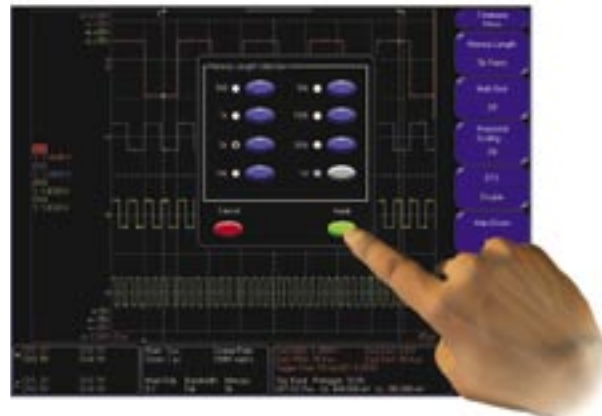
For expanded ease of use, the integrated touch screen provides direct access to all oscilloscope functions including acquisition, analysis and setup

# Full Featured Acquisition

See What Other DSO's miss

Sigma combines ultra-low noise and ultra-high precision amplifiers, providing better than 0.25% accuracy even at probe tip when using LDS-Nicolet's high performance Intelliprobes. A choice of digitizers lets you configure the scope that meets your needs: high-resolution 12-bit models for your physical, mechanical and powerline measurements, or a high-bandwidth 200 MHz model for your digital electronics and switched power applications. You can even mix hi-speed and hi-resolution in the same scope for control systems and mechatronics work.

An Extensive Array of Trigger Features

Sigma's comprehensive range of trigger tools easily isolates changes in amplitude, timing or continuing events. Advanced functions also let you detect more elusive faults such as drop-outs and phantom pulses. But even more importantly, only LDS-Nicolet provides the real-world ability to adjust sensitivity for stable triggers on noisy signals. That means you get a trigger you can trust – consistently.

Flexible Acquisition Memory

Short memories can cost the user more than they save. Megaword memories such as those found on Sigma are crucial to capture spurious or transient events for their complete duration without forcing a compromise of horizontal resolution. A unique dual time base in the 8 channel Sigma 90-8 Model allows channels to be acquired at different rates for maximum memory utilization.
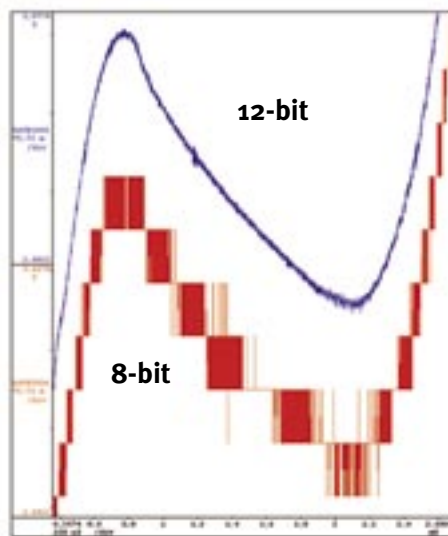
12-bit versus 8-bit
True 12-bit performance is clearly the better choice

For rapid bursts of events, Sigma's memory segmentation allows up to 2000 separate triggers to be captured in rapid succession with time stamping and almost no re-arm time.

Effective Rotational Measurements

All Sigma models include an External Clock input for synchronization with rotating machinery. But often a convenient clock signal such as 360 or 1024 per revolution is not available. Our optional Synchroscope® module fits inside, utilizing the Sigma's internal PCI slot to solve this common problem. The module provides the ideal solution for monitoring and analysis of engines, pumps, generators or any other application which requires data with respect to angular rotation.

The flexible Synchroscope caters to a wide range of input devices such as shaft encoders, magnetic pickups and pulses from the ECU. It clocks the scope with up to 0.005 degree resolution, plus provides a trigger signal from extra or missing pulses.

The Synchroscope even measures instantaneous speed between each pulse for torsional vibration studies, a uniquely powerful feature available in no other oscilloscope family in the world.

Each segmented sweep includes time stamping and almost no re-arm time

Unsurpassed Analysis Capability

The actual analysis performed on most DSOs is still relatively simplistic including only basic parametric functions. More extensive analysis often involves a tedious process of file conversion and data transfer to other software.

Flexible Real-Time Analysis
With Sigma, acquired data can be directly analyzed using any combination of unlimited real-time functions. Highly customized measurements can be defined using Sigma's formula editor, with results shown as new traces (FFT, integrate, +, -, x, ÷, filter) or as single values such as min, pk-pk, duty cycle or RMS. Formulas can be stacked to perform even complex analysis in real-time with every trigger.
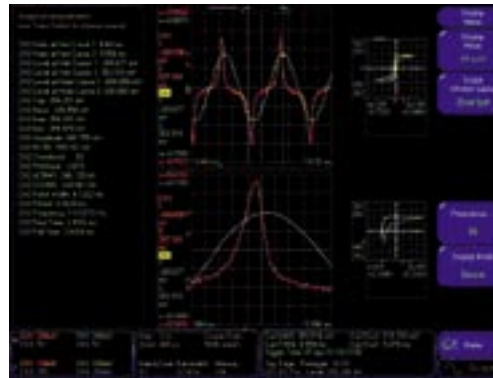
Windows Analysis and Report Generation
For reporting and printing results, data can automatically be transferred in a variety of formats to MS Word or the FlexPro software for customized report layout. And because Sigma is a full function PC, data and reports can be sent anywhere via network or modem. What could be more simple? Data can also be immediately posted to most popular Windows analysis packages including Excel, MATLAB, DIA-DEM and DADiSP.

Advanced Display Performance
The large high resolution touchscreen display offers a variety of display options and ample room for readout of current instrument settings. Up to 8 display windows with any number of traces can be viewed simultaneously. Main, zoom and user defined math traces can be viewed independently and scaled to user defined units. Then save in PDF format or print to any Windows printer at the touch of a button.

Sigma's large high resolution touch-screen makes it possible to view several types of windows simultaneously
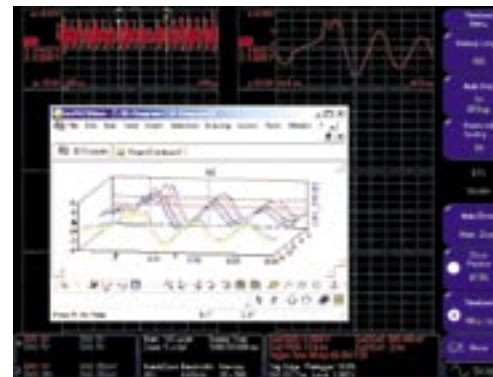
FlexPro can be installed directly on Sigma for advanced analysis & report generation

Sigma Software
To complement the wide-range of Sigma analysis capabilities, LDS-Nicolet offers a range of Windows based products.

FlexPro Analysis Software
Accepts data directly from Sigma offering an extended array of time and frequency domain analysis functions. Objects such as 2-D and 3-D plots and result tables can be placed in a report, word processor or on your web site.

DataSentry™ Remote Monitoring Software
Offers remote monitoring and control of Sigma for long distance troubleshooting applications. Enables Sigma to be programmed to automatically transmit data or reports based on predetermined measurement criteria. Data can be transmitted via Ethernet or modem, based on a simple trigger event or based on boundary conditions.

Sigma API Programmers Library
ActiveX control library enables complete customization of Sigma for automation and application specific situations. All scope functions and traces are directly accessible through our published DCOM interface.

Workstation Performance

PC Features

The Sigma series is the only DSO in its class to include an integrated, full-featured Windows PC.

Connectivity

- High speed 100 baseT Ethernet provides direct Windows network connection.
- USB 2.0 interface enables direct connection to a variety of external storage devices.
- Any Windows compatible printer.

Analysis

Data can be posted directly to many third party packages. No more messy file conversions. And with FlexPro software, data can be captured, analyzed and custom reports generated in a single, integrated solution.
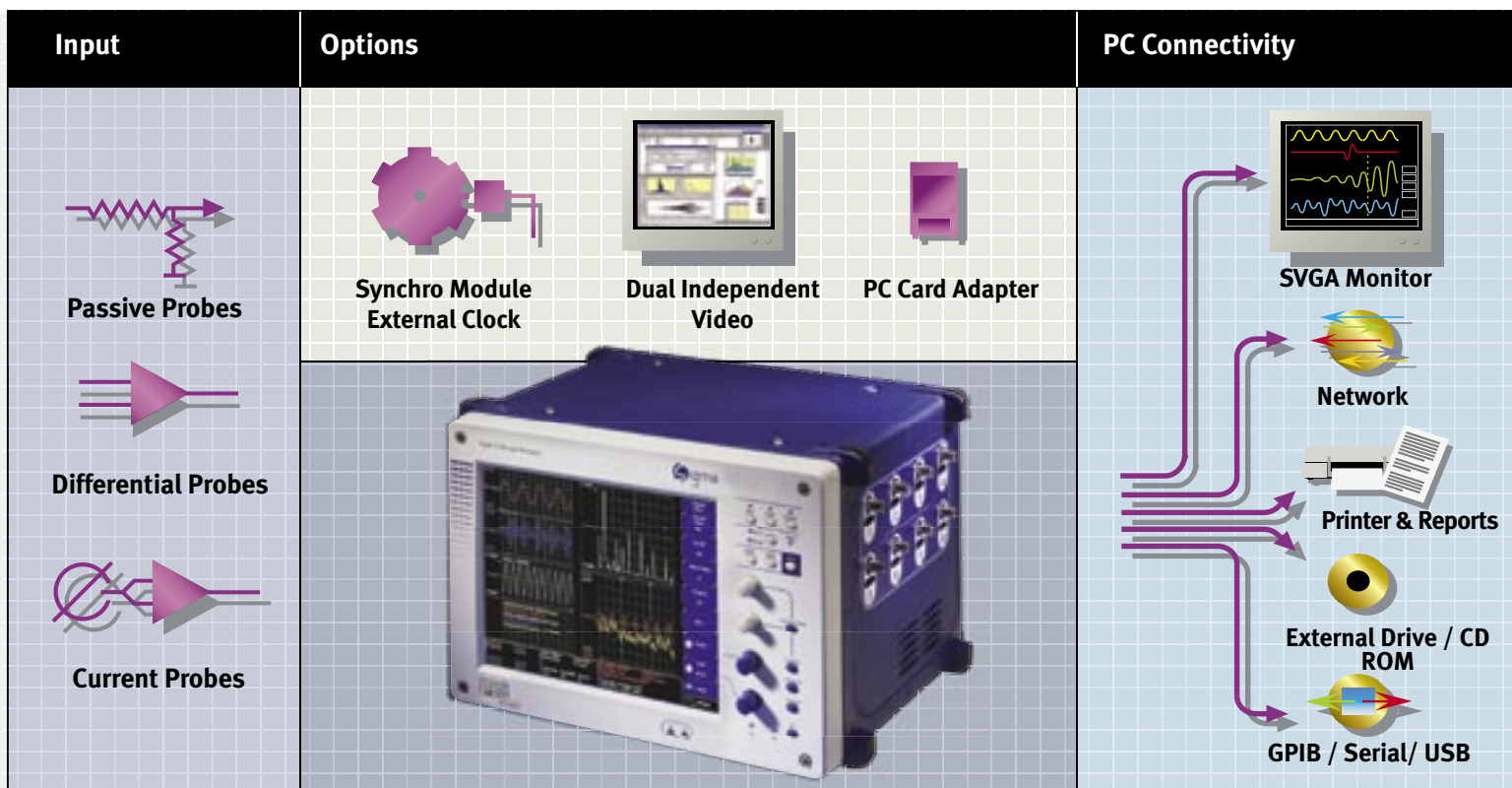
Data Archival

Standard Ethernet enables direct data interchange to any networked computer. Data can be stored locally or stored directly to a network location for instant file sharing.

PC Expansion

Sigma's expansion slot offers the ability to integrate a variety of LDS-Nicolet support cards:

- Optional Synchroscope module enables direct rotational analysis including support for instantaneous RPM measurements.
- Optional Dual Video module, view data on one display and analyze in MATLAB, Excel or LabView on the second.
- Optional PC Card adapter allows insertion of a variety of PC Cards including GPIB, modem, memory cards, etc.

Input	Options	PC Connectivity

Passive Probes

Differential Probes

Current Probes

Synchro Module External Clock

Dual Independent Video

PC Card Adapter

SVGA Monitor

Network

Printer & Reports

External Drive / CD ROM

GPIB / Serial/ USB

Sigma Models

	Number of Channels	Resolution	Maximum Sample Rate	Accuracy	Bandwidth	Input Filter Stages	Input Amplifier Type	Input Range	Number of Timebases
SIGMA 30	4	12-bit	10 MS/s	0.25%	5 MHz	500 kHz	Single ended, switchable to 2 ch diff	5 mV–20 V/div	1
SIGMA 60-4	4	8-bit*	200 MS/s	1%	200 MHz	20 MHz, 1MHz	Single ended	2 mV–5 V/div	1
		10-bit*	2 MS/s	0.5%	870 kHz	870 kHz			
SIGMA 75-8	8	8-bit	100 MS/s	0.25%	25 MHz	5MHz, 500 kHz	Single ended, switchable to 4 ch diff	5 mV–20 V/div	1
SIGMA 90	4,8	12-bit*	10 MS/s	0.25%	5 MHz	500 kHz	Single ended switchable to 2 or 4 ch diff	5 mV–20 V/div	1,2**
		8-bit*	100 MS/s	0.25%	25 MHz	5 MHz, 500 kHz			
SIGMA 100 and 100HV	4,8	12-bit*	100 MS/s	0.25%	25 MHz	5 MHz 500 kHz	Single ended, switchable to 2 or 4 ch diff	5 mV–20 V/div	1,2**
		14-bit*	1 MS/s	0.25%	435 kHz	435 kHz			

* Software selectable
** 8 Channel models only

Built for High Voltage Applications

The Sigma 100HV has the perfect combination of speed and resolution for your toughest electrical applications, from lightning impulse testing to switchgear measurements to power conversion. The Sigma 100HV incorporates a steel shielding that is built to withstand extreme electrical and magnetic fields to 100kV/m and 1000A/m.

Sigma is the only scope that meets the demanding performance of a reference digitizer in IEC 610-1-Ed. 2.0, "Instruments and Software used for Measurement in High Voltage Impulse Tests."

For the high voltage lab, Sigma completes the package with IEC 61083-2 compliant lighting impulse analysis. Automatically measure all standard IEEE 4/IEC 60060-1 parameters plus sophisticated analysis like transfer function. In one compact instrument you can measure, analyze, store and document your impulse testing with all the flexibility of a networked PC. And at a fraction of the cost and space of competitive systems.