



Land Vibroseis

SOLUTIONS

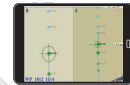


A COMPLETE SOLUTION

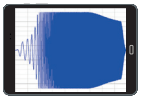
Source management



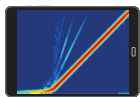
Integrated Guidance



Sweep Design



SmartLF



Data Harvester



WiNG



Nomad 65 Neo



PRODUCTS

NOMAD

Nomad is the Sercel range of seismic vibrators offering the highest fidelity broadband signals together with outstanding reliability, productivity and safety. These characteristics coupled with ease of maintenance and excellent ergonomic design have set a new standard for vibrator source performance. Designed for operation in all terrains (desert, arctic, forest, cities, etc.) and in the harshest conditions (-50°C/+56°C), Nomad vibrators can be customized to be ready for even the most extreme environments.



Nomad 65 Neo

Peak force output
62 400 lbf



Nomad 90 Neo

Peak force output
90 000 lbf

New generation control panel:
All important vibrator information gathered on a single ergonomic interface.



SOURCE MANAGEMENT

SMA is a server based Source Management solution that provides a global real-time view of vibrator operations. The SMA located in the recording truck also is a tool to monitor overall survey progress.

The Source management function handles:

Configuration


- Vibrator fleet definition.
- Vibrator servo parameters.
- Custom sweeps.

Monitoring & Source QC

- Vibrator DSD parameters.
- Controller status codes.
- Numerical and graphical views of vibrator performance parameters.
- Overloads and warnings.
- Geo-view for production follow-up and planning adjustments.

SMA is able to supervise and control up to 100 VE464 fleets.



SMA is compatible with two Sercel products: **WiNG^{NT}**  **508^{XT}** Powered by X-TECH

The SMA is fully integrated into Sercel WiNG system. The source manager can be hosted on a laptop located in the recording truck, interfaced in real-time (or not) with the DCM and located either in the recording truck or at the base camp close to harvesting/charging racks.



VE464

The VE464 is the industry reference for vibrators electronics with the largest installed base: more than 1500 DSD delivered.

The VE464 delivers and controls signals with the highest accuracy and speed, allowing users to carry out vibroseis projects with ease and flexibility while ensuring the highest productivity.

Features include:

- SmartLF for the effective, hassle-free reduction of low-frequency distortion.
- Optimized TDMA radio protocol to minimize communication delay.
- Management of up to 100 fleets of vibrators.
- Fully integrated with 508XT & SMA systems.
- Radio repeater mode to increase radio range (via up to 2 repeater stages).
- Possibility to use 2 radios per DPG with different frequencies to increase productivity.
- GPS time-based for precise timing & synchronization (+/- 10µs).
- Real-time QC and source signature for each vibrator.
- Easy setup phase to get vibrators into production quickly.
- Only vibrator electronics compatible with SRS and CleanSweep technologies.



VE464 DPG



VE464 DSD

PRODUCTIVITY

HIGH-PRODUCTIVITY METHODOLOGIES

Sercel source management has been the key enabler in the introduction of the methodologies that currently make it possible to reach the unprecedented high productivity levels that meet the industry demands for ever higher source point densities and the resulting reservoir image quality uplift.

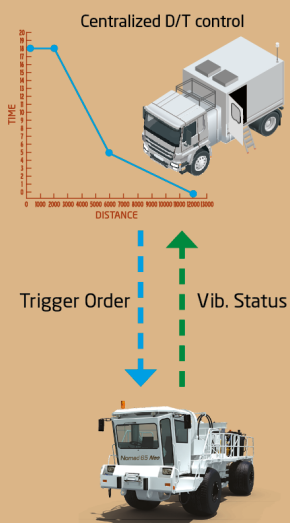
Here is the presentation of 3 high-productivity methodologies provided by the Sercel system:

DS3 & DS4 allow high productivity while retaining the best quality data quality thanks to centralized distance/time control by the acquisition system.

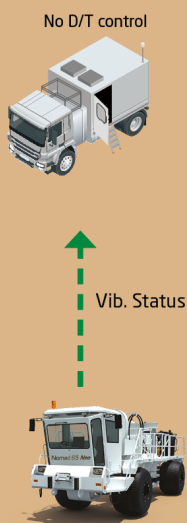
Unconstrained vibrators (ex. ISS) allows very high productivity via vibrator operation independent of the acquisition system, however this strategy does not control the distance/time relationship.

xDSS is at the crossroads between DS3 and ISS methodologies: It utilizes the best from both methodologies while addressing their intrinsic limitations. The distance/time control is decentralized at the DSD vibrator level enabling very high productivity and data quality.

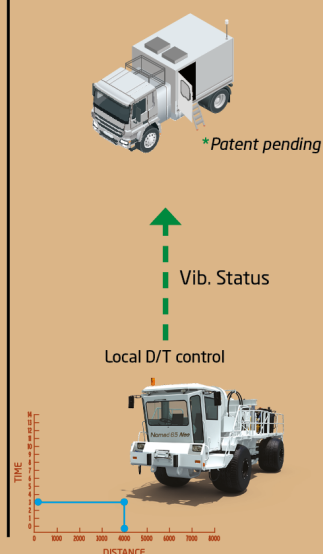
DS3 / DS4



Unconstrained Vibrators



xDSS*



	DS3 / DS4	Unconstrained Vibrators	xDSS
Distance/Time control	Yes	None	Yes
Distance/Time management	Centralized	N/A	Local
Source productivity	Affected by radio delay	Unconstrained	Unconstrained
Quality (randomness in time and space)	Randomness not mandatory, but affected by radio communication when necessary for processing	Poor when vibrators are in line of sight	Fully managed within radio range
Productivity	+	++	++

AUTO-GUIDANCE

Auto-Guidance is a solution that reduces the vibrator move-up time between 2 VPs. Installed in the diver's cab and connected to the Nomad Central Command Unit, Auto-Guidance is able to control and coordinate the vehicle speed and baseplate down command. Using the vehicle's real time GPS position and that of the next "target" VP, Auto-Guidance computes the most efficient deceleration profile on approach to the target and perfectly times the baseplate down command.

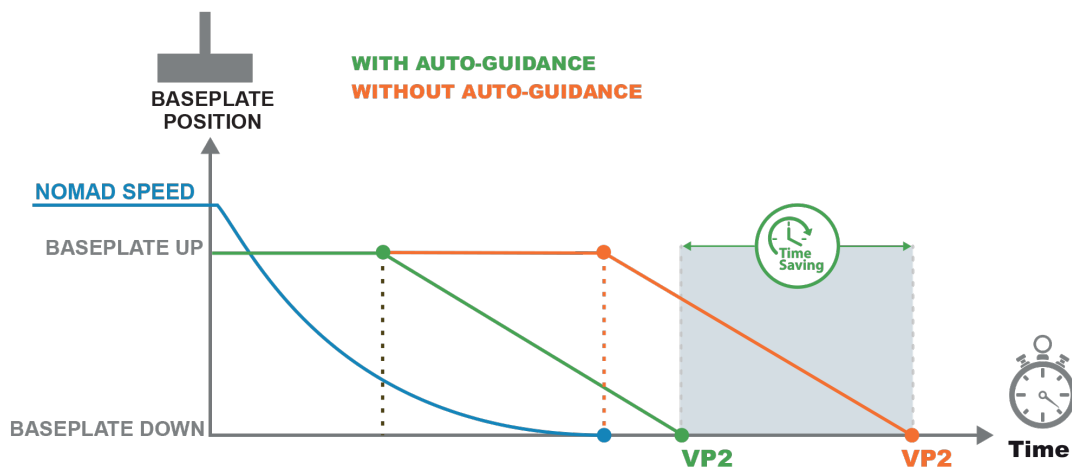
Reduced Move up time



With Auto-Guidance takes over control of the vehicle speed from the driver in order to provide the absolute shortest move-up time.

Reduces dead time associated with baseplate down

Allows for the advanced downward deployment of the baseplate avoiding the dead-time that on high production crews can be quite significant. The timing is perfectly synchronized ensuring that the vehicles comes to a stop immediately prior to base-plate touches the ground.



HSE

With the Auto-Guidance option the driver need only keep his foot on the throttle pedal during the deceleration phase. The Nomad's speed will be controlled and adjusted automatically.

- Driver fatigue is reduced as less throttle and break manipulation required.
- With speed managed automatically the driver can focus more time on his surroundings reducing the risk of external hazards.

OPERATIONAL EFFICIENCY

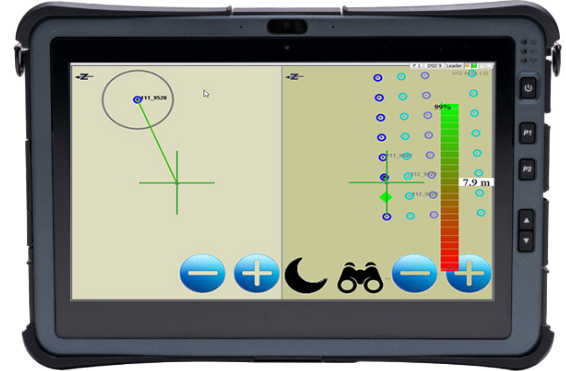
GUIDANCE

The VE464 Guidance software guides the vibrator driver to the next VP using a user friendly ergonomic display. A key tool for projects with stakeless survey.

VE464 Guidance offers many display options to fully adapt to the driver's needs.

New VP locations can be transmitted from the recording truck.

VE464 Guidance is fully integrated with Sercel's source management system for maximum operational efficiency.



DATA HARVESTER

Data Harvester VE464 (DH-VE464) software allows users in the field to exchange files with the 508XT or SMA systems using a handheld tablet PC. File exchange can be done via Wi-Fi between the vibrator tablet and the DH-VE464 (up to 10m). Range can be extended to 100m by adding an APU (Access Point Unit) antenna.

Thanks to Data Harvester:

- Reduce time spend to collect VE464 Segd.
- Secure and simplify process to retrieve VE464 Segd.
- Simplify process to upload SPS , Geodesy and Setup file in Guidance system.
- No need to wait until the end of the day to collect the files.
- HSE : less risks because the person wishing to recover the files can do it directly from a car and without leaving it thanks to the wifi connection with the vibrator.



INTELLIGENT POWER MANAGEMENT (IPM)

- IPM automatically adjusts the Nomad engine rpm to best match engine load. This reduce both fuel consumption and engine noise emission.
- Fuel consumption can be reduced by up to 15%.



AUTOMATIC SYSTEM



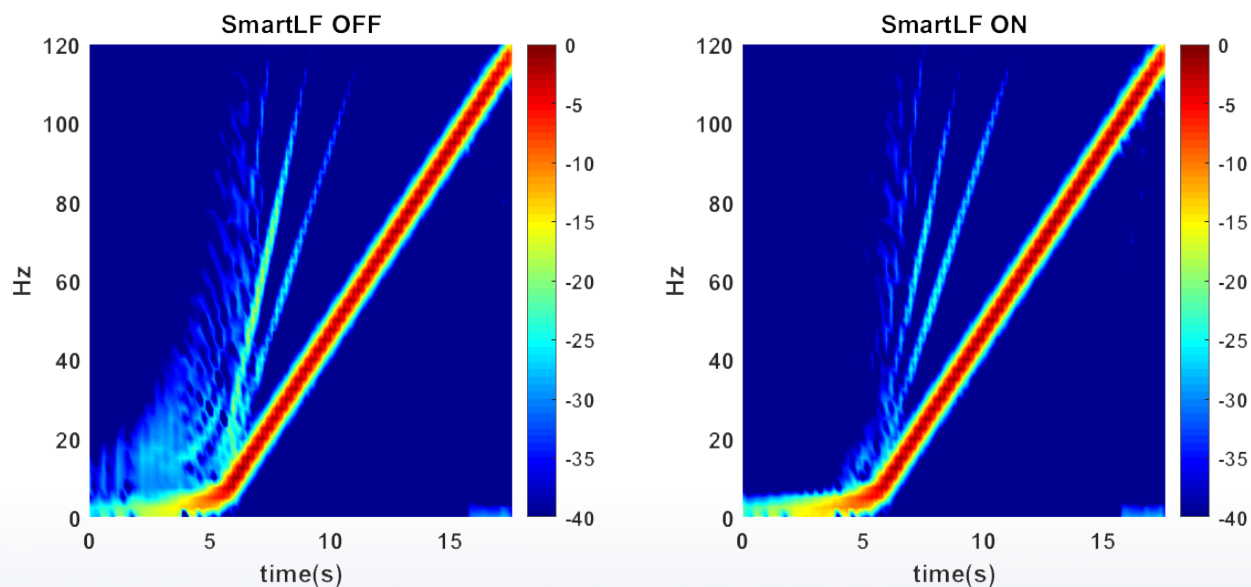
1. Automatic tire inflation reduces risk of accident by ensuring tire inflation is also optimal. In areas where tire pressure needs to be varied when transitioning from hard ground to soft sand and back time saving can be significant.
2. This option makes refueling faster, safer and easier. Specially designed for high production crews with large vibrator fleets or when environment & terrain make refueling more difficult.
3. Auto lubrication reduces field mechanic's exposure to risk, is a time saver and protects the vehicle by ensuring the regular vehicle maintenance schedule is adhered to.

DATA QUALITY

SMARTLF

SmartLF is an efficient and straight forward solution to significantly reduce low-frequency distortion. Custom low-dwell sweeps are in use across the industry as the best practical means of contributing to high resolution final images. Clean low-dwell sweeps have been historically difficult to produce. With SmartLF the challenge has been overcome and better data quality is ensured.

SmartLF is seamlessly integrated within the VE464 electronics. It is extremely easy to use with no requirement for specialized expertise, calibration, additional mechanical components, additional signal recording or nonstandard vibrator settings.



TRUEBROADBAND

A game-changing solution that delivers enhance sub-surface resolution by enabling the production & recording of up to 8 octaves of seismic energy.

Nomad vibrator can produce sweeps from 1Hz to 250Hz.

The Nomad Neo and the VE464 control electronics has been improved to better produce low frequencies, while preserving the quality of the higher frequencies. Nomad Neos controlled by VE464 are without doubt the best broadband vibrator solution on the market.

#TrueBroadband



QUALITY CONTROL (QC)



A complete QC database is generated for real-time or post-processing analysis and including phase, distortion and ground force. This quality control system allows the user to monitor the entire vibrator fleet over the life of a project and to detect any trends that might develop. If the vibrators are not performing optimally it is sure to be detected and reported.

The complete vibrator signature including Ground Force and Reference can be retrieved by radio at the recorder for in-depth analysis using the QC Analyzer software.

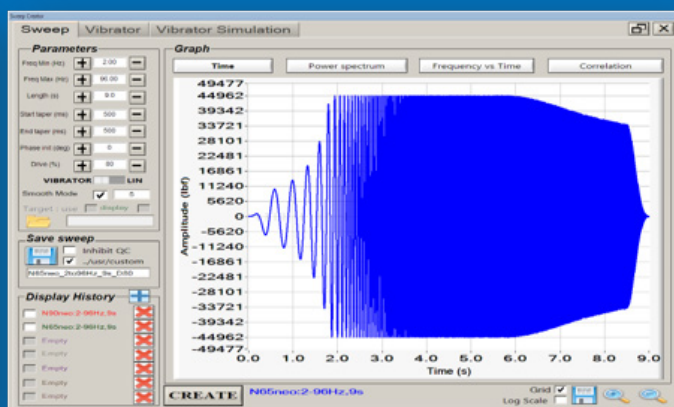
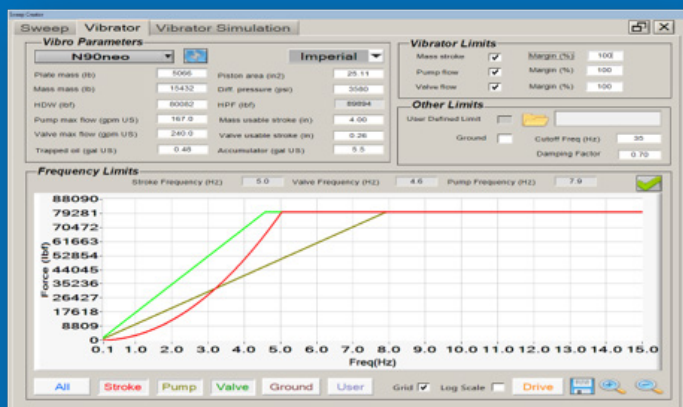


SWEEP DESIGN

Sercel provides a tool to design linear and custom low and high dwell sweeps in order to maximize the vibrator emitted energy while guaranteeing signal quality.

Integrated within the VLI software, "Sweep Creator" is a tool dedicated to sweep design. For given sweep parameters, the tool enable the user to create sweeps that closely match the specific mechanical and hydraulic constraints of any specific vibrator model. Adjustment to match local ground characteristic can also be input by the user.

Sweep design is based on the Sercel patented Emphaseis® algorithm.



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