

SMARTSOLO
S C I E N T I F I C

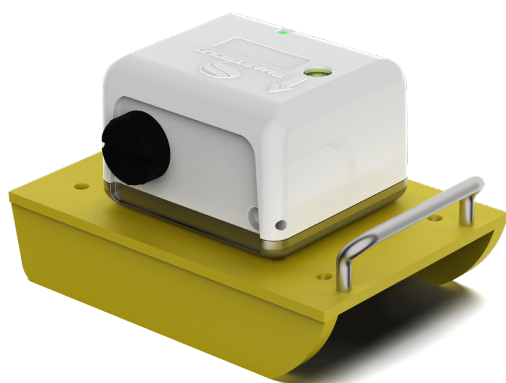
NORDIC  **GEOPHYSICS**
TOP-NOTCH SUBSURFACE EXPLORATION SOLUTIONS

 **SeisSolo**
SMART SEISMIC LANDSTREAMER

The Leader in Serving Geoscience

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High Reliability, Portable, Resistant to Harsh Environment

Features

- Cable-free integrated design, designed to operate effectively in various terrains
- Built-in DT-Solo 3-Component high-sensitivity geophones
- 32-bit $\Sigma\Delta$ high resolution ADC up to 0.25ms sampling rate
- Construct seismic network system easily and efficiently
- USB interface supports high-speed data download, charging and long-term power supply via External Power Battery
- Built-in Bluetooth module, data waveform view, equipment status QC, station finding
- Red and green LED indicator, green for 'good', red for 'bad'
- Built-in GNSS module for GPS time synchronization and positioning, time accuracy up to 10 μ s
- Wide range of operating temperature (-40~+70° C)

Applications Methods

- MASW (Joint Rayleigh Wave & Love Wave Analysis)
- Converted Wave Seismic Analysis
- SPAC/ESPAC (Microtremor Method)
- ReMi (Refraction Microtremor)
- HVSAR (Spectral Ratio Method)
- Reflection and Refraction Seismic Survey

Applications

- Mineral Exploration
- Urban Geological Survey
- Geothermal Investigation
- Formation Settlement Survey
- Road Foundation Survey

Product Overview

A high-end nodal-based landstreamer comprising over a decade of practical and theoretical experience:

SmartSolo and Nordic Geophysics, two industry leaders in geophysical technology, jointly launch of SeisSolo, a groundbreaking seismic landstreamer designed to revolutionize the field of geophysical exploration.

A join solution from Smart Solo and Nordic Geophysics for a wide variety of geophysical applications: higher receiver fold, improved versatility and effective to operate in different terrains.

SeisSolo Landstreamer inherits the advantages of SmartSolo Scientific's high reliability and consistency in the field, providing exceptional temperature stability, and data redundancy. We have made another breakthrough in 3W (Wave, When, Where) by using innovative technology in the geophysics field and combining the latest hardware and software technologies in the Internet age with the addition of USB, wireless communications and other functions.



Advantages

SeisSolo: A Cutting-Edge Nodal Landstreamer for Enhanced Seismic Surveys

System Flexibility and High Efficiency in Construction:

The Land-sled design significantly improves construction efficiency, allowing for easy transformation of the observation system. The station spacing can be flexibly adjusted as needed, without being limited by intersections, obstacles, or special terrains. The entire construction process has minimal impact on traffic flow and municipal facilities, enabling non-intrusive operations.

High Precision and a New Exploration Experience with Multiple Methods:

The DT-SOLO three-component sensor array provides high-resolution seismic data and supports an extendable 200-channel variable-spacing towed cable system. It is fully compatible with various exploration methods, such as reflection, refraction, Converted-wave, MASW, and HVSR, meeting diverse data acquisition needs and achieving high-precision exploration results.

High Reliability and Resistance to Harsh Field Environments:

The highly reliable Landstreamer system capable of withstanding towing over a distance of 4 kilometers. It has undergone multiple tests, including drop tests, submersion, and high and low-temperature impact. Upholding SmartSolo's craftsmanship and superior manufacturing, the SeisSolo Landstreamer system ensures reliable and efficient operation in a wide range of harsh field environments.



Specifications

General Specification

Parameters	Specification
Seismic Data Channel(s)	3
Physical Size	126 (length) * 112 (width) * 83 (height) mm (not included Sled)
Weight	1.5 kg (not included Sled)
Waterproof	IP68
Operating Temperature Range	-40°C ~ +70°C
Charging Temperature Range	+3°C ~ +45°C
Charging Time	<3.5 hrs
Operating Life@25°C	11 days @ 2 ms, 24 hrs/day operation 22 days @ 2 ms, 12 hrs/day operation
Data Storage	64 GB(expandable to 128 GB)
Data Harvesting	USB 2.0
Bluetooth QC	Support
GNSS Mode	Support GPS,BEIDOU,GLONASS, single mode or dual mode optional



Channel Performance

(@2 ms sample interval, 31.25 Hz, 25°C, unless otherwise indicated)

Parameter	Specification
ADC resolution	32 bits (The ADC has 32-bit resolution, the noise-free resolution is no more than 24-bit)
Sample intervals	0.25,0.5,1,2,4,8,10,20 ms
Preamplifier gain	0 dB to 36 dB in 6 dB steps
Anti-alias filter	206.5 Hz @2 ms (82.6% of Nyquist) Selectable - Linear Phase or Minimum Phase
DC blocking filter	1 Hz to 10 Hz,1 Hz increments or DC Removed
Maximum Input Signal	±2.5 V peak @Gain 0 dB
Instantaneous Dynamic Range	125 dB @Gain 0 dB
Equivalent Input Noise	0.18 µV@2 ms Gain 18 dB
Total Harmonic Distortion	<0.0002% @Gain 0 dB
Common Mode Rejection	>100 dB
Gain Accuracy	<1%
GNSS Time Standards	1 ppm
Time Accuracy	±10 µs, GNSS Disciplined
Cross feed	< -110 dB
Phase difference between channels	<0.1 ms
Transverse vibration suppression	Better than 0.1%
Consistency of amplitude between channels	5%
System Dynamic Range	145 dB
Frequency Response	0~1652 Hz @0.25 ms

Acquisition Performance

Parameters	Specification
Natural Frequency	5 Hz
Spurious Frequency	>170 Hz (>150 Hz in horizontal sensor)
Coil Resistance	1850 Ω
Distortion	<0.1% @12 Hz, (0° ~ 10°) vertical tilt, (0° ~3°) horizontal tilt
Damping	Open Circuit Damping: 0.60 Damping with 43kΩ: 0.70
Sensitivity	80 V/m/s (2.03 V/in/s)
Remark	All parameters are specified at +22°C in the vertical position for vertical geophone and horizontal position for horizontal geophone unless otherwise stated

Note: SmartSolo Scientific reserves the right to modify this manual.
Any changes made will not be notified separately.

TB Time recorder (TBR)

TB TIME recorder is a high precision recording instrument that records the TIME BREAK time required by the ground.

It can be used for the time recording of a variety of excitation signals with us precision.



Support Bluetooth transmission
and have an internal TF card for local storage.



Support pulse signal excitation and closed-signal excitation.
no requirement for external power supply in closed-signal excitation.
To change the input signal type just pressing button on the recorder.



With internal buzzer
for indicating successful recording.



Support USB charging
better compatibility with frequent-used charging devices (e.g. power bank, USB adapter).



Small size, less cables, internal battery



Embedded GPS/BeiDou module
high portability and ease of operation.



Connect to smart phone or other Android devices via Bluetooth
real-time monitoring recorded event time stamps on SoloTB app.
The OB Log file can be generated and transmitted on Android devices.

Specifications

Channel Characteristics

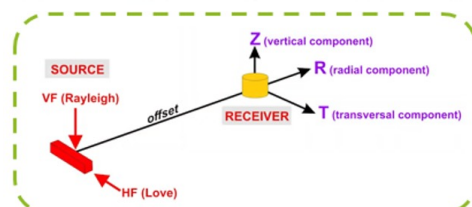
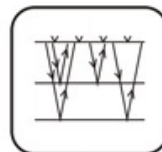
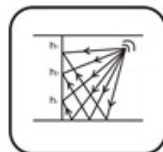
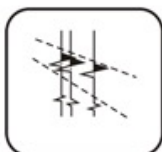
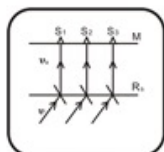
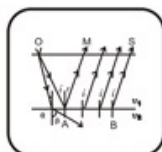
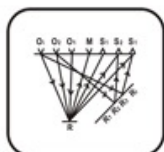
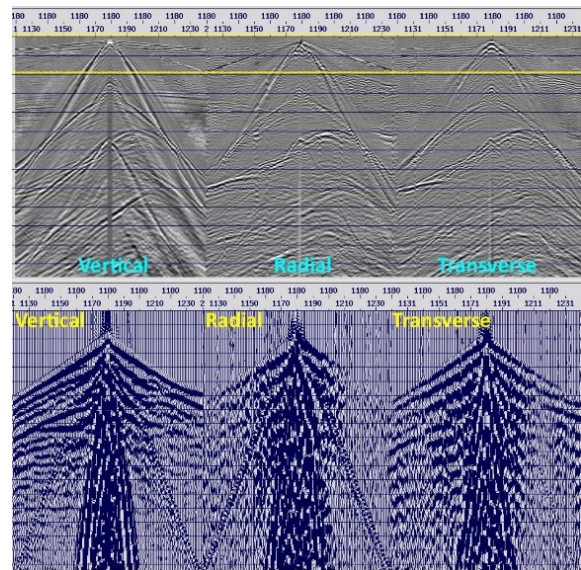
Dimensions (L x W x H)	135.5mm (Length) × 114mm(Width) × 53mm(Height)
Weight	0.67kg (not including Signal Cable)
Port	1*Type C Port, 1*Signal input port
Status Indication	1*GPS LED;1*Bluetooth LED;1*Charge LED;1*Buzzer
Switch	1*Power Switch; 1*Signal Switching Switch
Time Accuracy	±1 μs
Time Resolution	1ns
Antenna Type	Built-in GPS Antenna
Operating Temperature	-40°C ~+70°C
Operating Humidity	20%~90% RH, non-Condensing
Protection Level	IP67
External Working Power Supply	5V, 2A
Charging Voltage	5V, 2A(It varies depending on the adapter support agreement)
Charging Temperature	+3°C ~+45°C
Internal Storage	8GB
Battery Life	The built-in battery can work continuously for 60 hours

Seismic Source

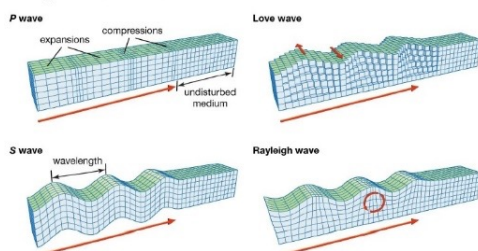
Hammer Source

Hammer source is a small artificial source used in geophysical exploration and engineering geological survey, mainly for shallow ground structure detection. It generates mechanical shock by hitting metal plates or other hard objects (such as steel plates, rock surfaces, etc.) with a hammer, thereby propagating elastic wave underground.

This method is simple to operate and low in cost, and is widely used in shallow seismic exploration, such as soil structure detection, groundwater distribution research, small engineering surveys, etc.



Main types of seismic waves



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New generation of seismic instruments | New generation of electrical instruments |
New generation of data acquisition systems