

# User Manual

## Seismex16 A1

### Subsuelo3D S.A.S



**SEISMEX16**

S/N: 000201618  
POWER: 12V(DC) -500 mA  
[www.subsuelo3d.com](http://www.subsuelo3d.com)  
Hecho en Colombia

## **Installation instructions Seismex16 A1:**

1. Enter the folders: setup/Volume, run the file "setup.exe" and click on "next" until the installation is finished.
2. Go to the drive where the program is installed (usually drive C); go to the Program Files folder (or Program Files (x86)), then modify the permissions of the "Seismex16 A1" folder. This is done like this:  
Right-click on the folder "Seismex16 A1", click on "properties", click on "security", click on "edit" and for each user, enable the option "full control" or "full control". After enabling everything, click "Apply" and "OK".
3. Replace the configuration file "Seismex16 A1" in the folder that was changed to the "Seismex16 A1" file (same name) on the installation CD in the "Seismex16 A1" folder.

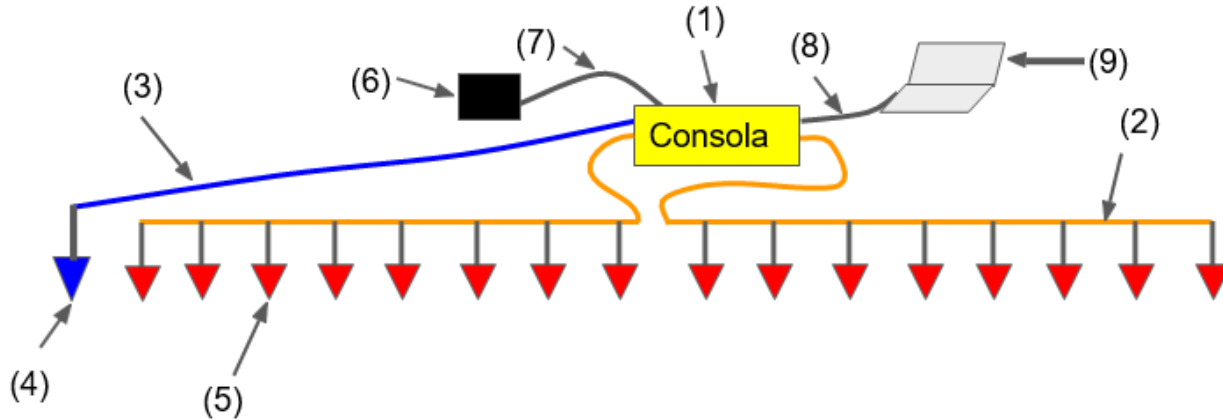
The software is now ready to acquire data!

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# 1. Deployment procedure and connections:

1.1. Put cable on the acquisition line and make the connections according to the diagram and the description of parts:



The battery (6), is the last thing that is connected before the acquisition starts and the first thing that is disconnected when the acquisition is finished. The equipment DOES NOT have AN ON/OFF switch; the ON/OFF occurs automatically when the battery is connected or disconnected.

# 1.1 Description of the parts:

- (1): Main Console Seismex16.
- (2): Cable that connects the signal from the geophones (5) to the main console (1).
- (3): Cable that connects the Trigger geophone (4) to the main console (1).
- (4): Trigger Geophone.
- (5): Geophones that detect vibrations that are present on the ground.
- (6): 12 V battery
- (7): Cable connecting the battery (6) to the main console (1).
- (8): USB cable connecting the main console (1) to the computer
- (9): Laptop for data acquisition

## 1.2 Detailed connection of parts of the seismograph

**1.2.1. Signal cable (2) to the main console (1):** Each cable connector is labeled “1”, “2”, “3”, and “4”; each connector must be connected to its respective console receptacle according to the number.



**1.2.2. Trigger cable (3) to main console (1):** The 3-pin circular connector of the trigger must be connected to the receptacle marked with the letter "T":



**1.2.3. USB cable (8) to main console (1):** The “printer” type USB connector must be connected to the receptacle marked “USB”, and on the other end to any free USB port on the PC:

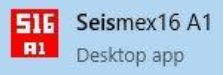




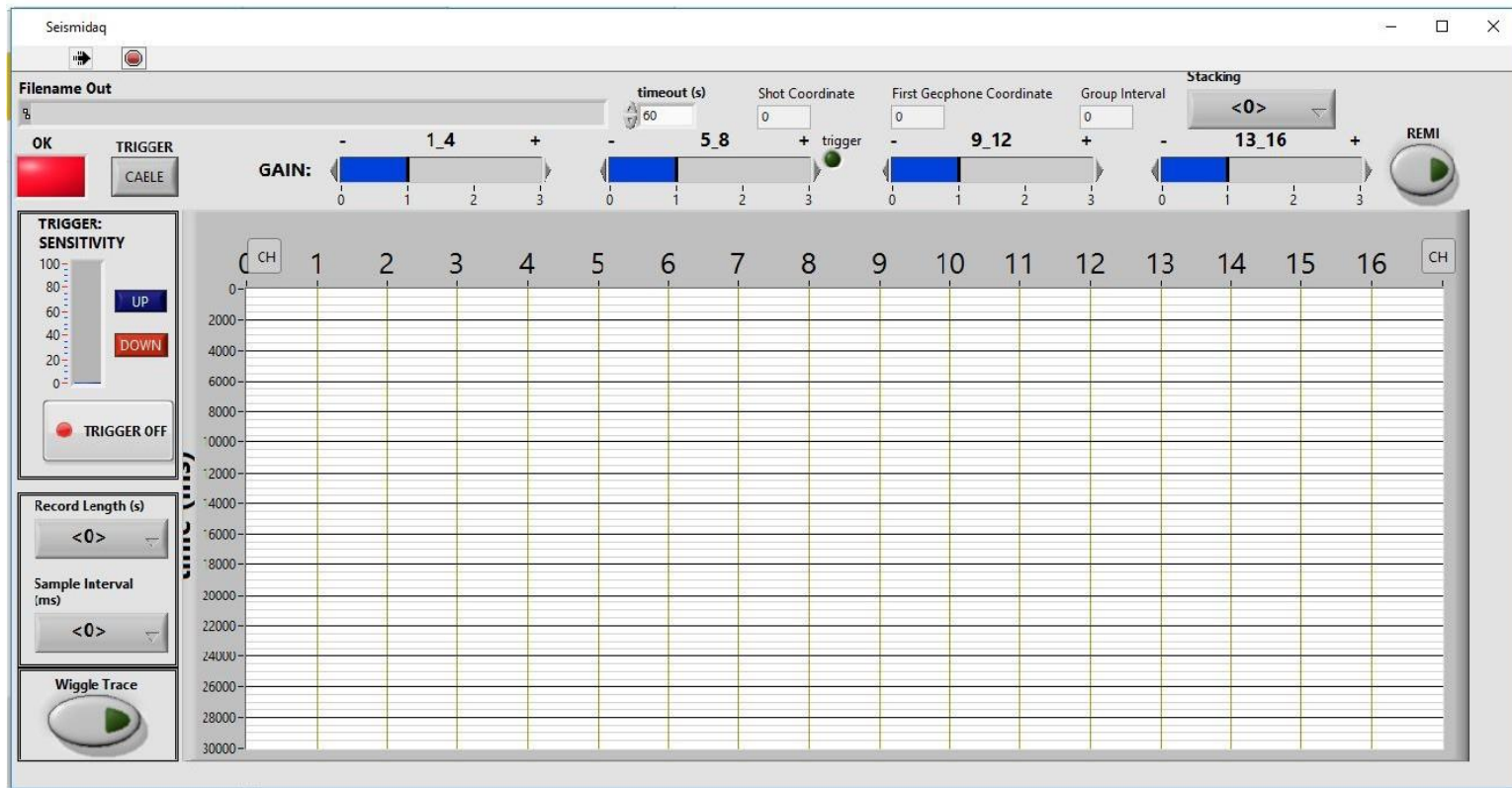
**1.2.4. Battery cable (7) to the main console (1):** The 2-pin battery connector, must be connected to the receptacle marked “BATT”, and the other end to the 12 V DC battery, with the red terminal positive and the black terminal negative:





## 2. Data Acquisition Procedure:






Once the cable has been watered along the line, and all geophone connections to the cable/signal cables and the main console have been made, the Seismex16 A1 software is run , which shows the main screen, as seen in the following figure:

# 2.1 Main Screen

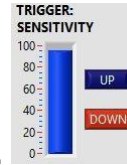


## 2.2 Description and function of the main screen elements:

**2.2.1 “OK” indicator:**   If is green, the USB connection is correct and the console was recognized by the acquisition software. If it is red, the console was not recognized and there may be a problem with the connection or USB cable.

**2.2.2 Button “TRIGGER”:**   By default it displays the word "CABLE"; indicating that the computer will log data only when the geophone is hit close to the trigger geophone previously activated the "TRIGGER ON/OFF" button . If activated by the user, it changes to THE word “MANUAL”; this allows the equipment to acquire data without having the trigger cable connected. Simply activate the “TRIGGER ON/OFF” button to start recording.  

**2.2.3 “TRIGGER SENSITIVITY” control:** This control is used to vary the trigger sensitivity, for example in noisy environments it must be reduced so that the equipment does not record false data as a result of accidental or automatic trigger fires. This control

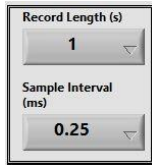


can be varied at any time during data acquisition.

**2.2.4 "TRIGGER ON/OFF" button:** This button is activated when you want to start the data registration, either through cable trigger, or through manual trigger.



**2.2.5 “Record Length” and “Sample Interval” controls:** The first is the record length, i.e. the data recording time; by default, it is 1 sec, but can be adjusted according to the user's need. The second control is the sampling interval, i.e. every time a sample of the signal is acquired; by default, it is 0.25 ms, but can be adjusted according to user requirements.



**2.2.6 “Wiggle Trace” button:** Activating this button provides a display of seismic tracks whose positive values are colored with black. This is useful for having good image

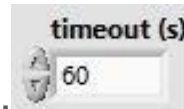
contrast on sunny days.



**2.2.7 “GAIN” controls:** There are 4 gain controls, these vary the amount of amplification applied to groups of 4 channels. It is useful in low-noise environments where long lines are made and the maximum offset is large. The gain can be varied at any time during data acquisition.



**2.2.8 Control “timeout”:** This control sets the number of seconds the system waits for a trigger shot to occur; if this time has elapsed, no trigger has occurred, an error message will be displayed and another wait cycle will start. This is done to avoid possible computer



crashes. Its default value is 60 seconds.

**2.2.9** Indicators with Configuration Information: These indicators show the configuration that was chosen for the firing point being made.

Shot Coordinate	First Geophone Coordinate	Group Interval
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

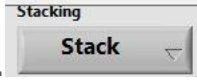
**Shot Coordinate:** This is the location (in meters) of the shooting point. Example: 0 m.

**First Geophone Coordinate:** This is the distance (in meters) from the first geophone to the trigger coordinate. Example: 5 m.

**Group Interval:** This is the separation (in meters) between Geophones. Example: 5M



**2.2.10 Control “Stacking”:** With this control, you can choose whether to stack automatically, that is, add shots and generate a single \*.sgy file or stack manually in processing, and thus generate so many files. \*.sgy as there are shots in the data. By default, the software does automatic stacking, although it is recommended to do this in processing, as better quality control is achieved.



**2.2.11 “REMI” control:** If this button is activated, the system is enabled to register the Remi method. The parameters “Record Length” and “Sample Interval” are set by default to 30 s, and 2 ms respectively.



When ReMi is performed, the trigger can be manual (recommended) or wired.

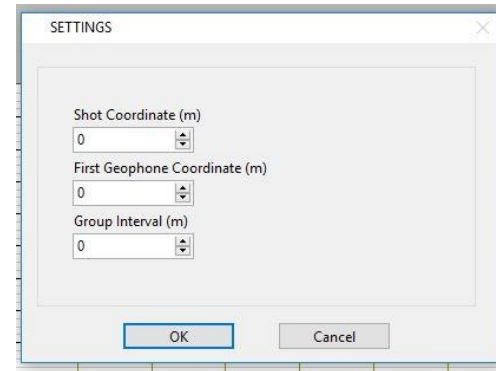
**2.2.12** parameters window "SETTINGS": In this window geometric parameters are configured each time a trigger point is to be made.

For the following example, 4 trigger points are made along the line; the trigger must be moved to the location of each point, and that is where the source will be located (hit with the hammer). At each trigger point, First Geophone Coordinate and Group Interval, constants are left (at 5 m for this example) and the only thing that varies is Shot Coordinate.

**For REMI all values are left at zero(0).**

**To acquire a shooting point, see Item**

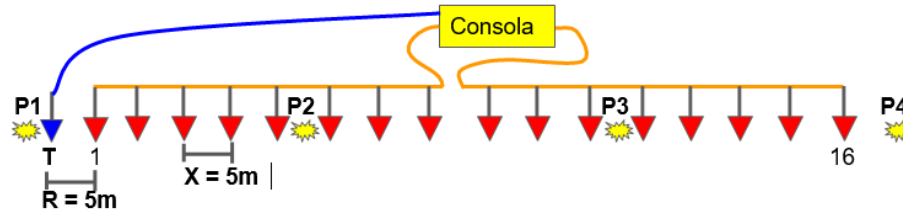
**"4. Sequence to acquire a firing shot"**



# 3. Ejemplo de Adquisición de una Línea de Refracción Sísmica:

Seismic refraction line with the following requirements: Separation between geophones (5 m), distance from the first geophone to the source (5 m), sampling rate (0.25 ms), record length (1 s).

T: The trigger geophone must be located at the trigger point Ex: 0 m (Shot Coordinate for P1).

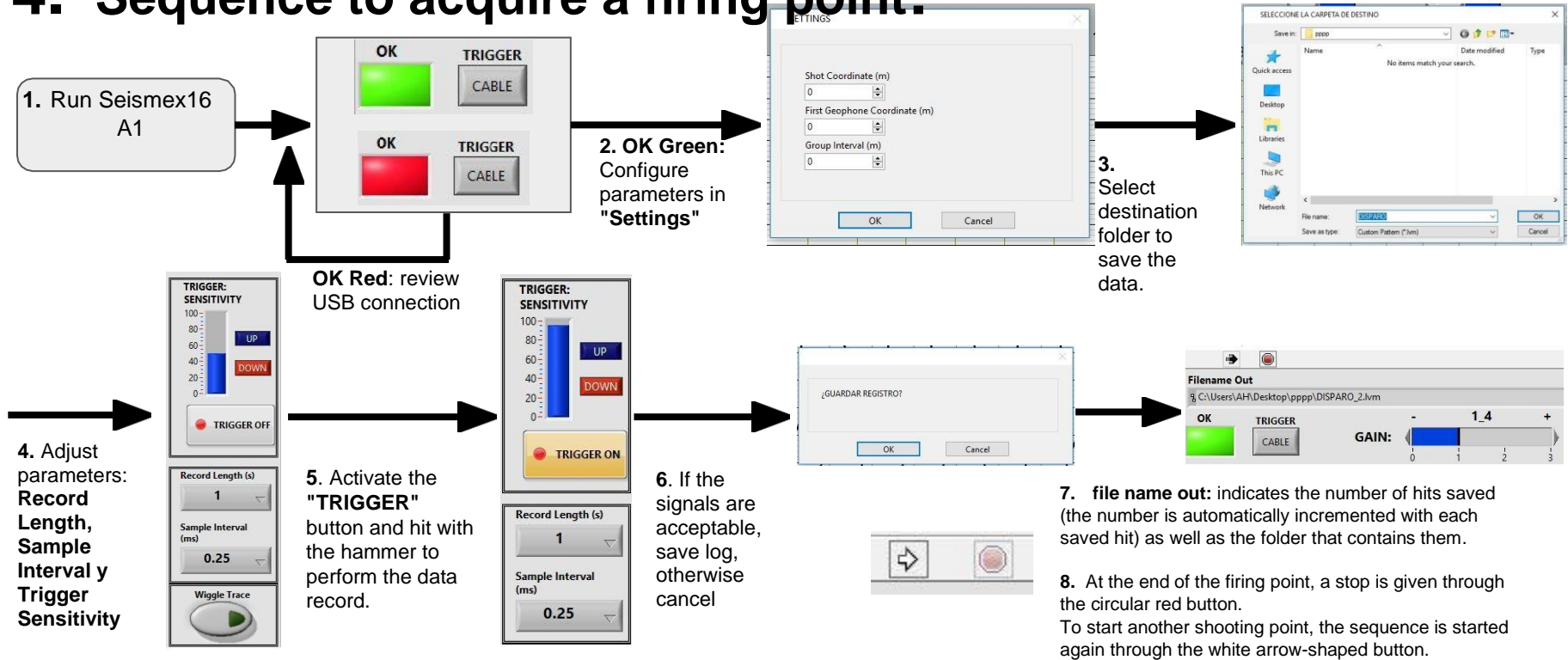


R= Separation between the first geophone and the source e.g. 5 m (First Geophone Coordinate)

X= Separation between geophones. E.g.: 5 m (Group Interval)

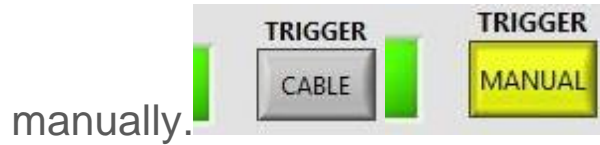
4 shooting points are performed: P1, P2, P3, and P4, located at 0 m, 27.5 m, 57.5 m, and 85 m respectively. These are the values for Shot Coordinate

# 4. Sequence to acquire a firing point:



## 5. Novedades de la versión Seismex16 A1

- A "TRIGGER" button is added that allows you to choose between shooting by cable or



- A "REMI" button is added that allows you to perform the Remi method without using other software as was the case in the previous version. Just by activating this button,



the system automatically configures the Sample Rate and Record Length.

## 6. Recommendations

- Measure during the day the voltage of the battery, being connected to the main console, and be alert that it does not fall below 11 volts.
- Charge the battery in the afternoon or evening.

### **Precautions:**

- Under no circumstances short the battery
- Avoid heavy blows to the seismograph
- Do not immerse the seismograph in the water
- Do not bring the seismograph or cables to the fire