

InSite Seismic Processor: Import of SEGY data

v 3.16.3



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InSite is an integrated data acquisition, management, processing, visualization and interpretation software developed for seismological studies. InSite provides a solution for all seismology applications, ranging in scale from acoustic emissions in the laboratory, through microseismics around mining and petroleum fields, up to regional-scale earthquakes.

The following sections present a summary on how to import data in SEGY format. You can also find further tutorials and demonstration videos in the 'Support' section of our website appliedseismology.co.uk.

1. Step 1 Project Setup

The first step when working on a project in InSite is the import or creation of a sensor array with channel numbers matching those in the harvested or imported seismic waveform data files.

 In InSite's 'Data Visualiser' click 'Project->Edit Default Arrays-> Receivers'.Alternatively, the same Dialog can be called clicking on



in the main toolbar in Data Visualiser

2. the array can be imported from a ready-made .sen or .csv file following the format described in the User Manual by clicking Import from File. Alternatively, each sensor can be manually added by clicking Add and completing the properties menu.

it Default Re	ceive	r Array	/							×
The Default Re Would you like D Receivers in	eceive to imp Array	r Array port a F	r is used t Receiver a	o map Re Array fro	eceiver infi	ormation to (Channels whe	n importin oort from F	ig data. File	
Instrument	E	A	Resp.	Label	North	East	Down	Units	Diam.	Add Edit Delete Stack Unstack Check Orientation Export
								CLOS	E	

Figure 2: Array Input and Edit Dialog

it Default Re	ceive	r Array	/							×
The Default Ro Vould you like	eceive to imp	r Array port a F	r is used t Receiver <i>I</i>	o map Re Array fro	eceiver info om an exter	ormation to (nal file?	Channels wher	n importin ort from F	g data. File	
Instrument	E	A	Resp.	Label	North	East	Down	Units	Diam.	Add Edit Delete Stack Unstack Check Orientation Export
								CLOS	E	

Figure 3: Array Input and Edit Dialog

2. Step 2 Data Import

- 1. On import of any waveform data, InSite will create an ESF file for each event, containing all the waveforms corresponding to the imported event. Therefore, the first step is creating an empty folder to store the ESF files.
- 2. From data visualiser, click on the 'Import and Manage Data' button. Alternatively click 'Project>Import and Manage Data...' from the menu bar.



Figure 4: Import and Manage Data button in InSite's data Visualiser

3. The import dialog window will launch. Select the SEGY data format form the drop-down list.

SEGY	~	Data Prope	ortioc	Clear Dire	ctories	Compon	ent Directory:	
ATF	~	batarropt	01000	cical bire	ccorres	Colgon	tent birectory:	
SIGA						G. (sup)	voi r (upsaia (upsaia (Browse
STWIF	s	EGY\			Browse		>	
SEGY		-			browse	Compos	ant Position9 9e+100	
SEG-2	m	ns to ESF forma	st			Compor	-9.9001	
SEG-D								
SSA						Available	disk space for ESFs:	
ISF						401,481,	588,736 bytes (Disk Size = 1000202 Mb)	
ISF Master/Slave					Browse			
CF CTC AN							Disk Space Critical Level (MBytes) =	100
AZU	d	sub-directories	of the "ESF	Storage Direc	tory"		blak Space Chacal Level (Hoytes) =	100
ZU								
Soultz		A	vailable data	to select for	import:		Project Components:	
AC Binary		<u>^</u>	Data sub-din	ectories an		Salact All	🕀 🗖 upsala	
AiniSEED				eccorres ann		Select All		
TR						->IMPORT->		
PFC								
-File Format						Inspect		
RDB								
PUN								
RC								
WF								
PF								
SV	~							
raw data_0012.sgy								
raw data_0013.sgy								
raw data_0014.sgy								
raw data_0015.sgy								

Figure 5: Selecting data format in InSite's 'Data management' dialog

4. Some additional data properties are available for the import of SEGY data related to the scaling of waveforms. The dialog launches automatically on selection of SEGY format or alternatively, can be launched at a later stage by clicking the 'Data properties' button.

File Import Properties	×
Data Import Scaling	
Apply Receiver Scaling on Import	
Apply Weighting Factor on Import	
Use SEGY Format from Sercel	
Waveform Data range = Pre-scaled Amplitude	~

Figure 6: Data Properties dialog for the scaling of imported SEGY files

- If the user selects to 'Apply Receiver Scaling on Import' the sensitivity and gain values from the default receiver array are used to update the imported waveform amplitudes.
- The default behaviour if the 'Apply Weighting Factor on Import' box is checked is to apply the weighting factor from trace header field at byte 169 following the SEGY revision 1 standard.
- The 'Waveform Data range' can be set as 'Pre-scaled Amplitude', where the imported data are assumed to be in volts, or a bit sample range, where the imported data are converted to volts using the counts range specified by the bit sampling chosen by the user and the maximum volts range from the default receiver array.
- Checking the option for SEGY from Sercel reads the trace number and sub-second start time fields from the SEGY headers following the Sercel convention instead of SEGY revision 1 standard. The millisecond is from byte 169-170 and the microsecond is from byte 171-172. In addition, the descaling factor from bytes 207-210 and the descaling power from byte 211-212 are used to compute the descaling factor 10A(-descaling power).
- Checking to 'Apply Weighting Factor on Import' when the Sercel type is selected reads and applies the descaling factor from the Sercel file SEGY header, otherwise applies the descaling factor from byte 169. Note in situations when user can only import their SEGY not acquired by Sercel tools using Sercel format is likely due to the missing of trace number. InSite reads trace number from trace header at byte 3,4,5,6 for regular SEGY and from byte 7,8,9,10 for Sercel Segy format.
- 5. Select the 'Import directory' containing the SEGY waveform files and the 'ESF storage Directory' where Insite will store the created ESF waveform files.

InSite- Import of SEGY data



Figure 7:Configuring import and storage folders in InSite's 'Data management' dialog

6. InSite will assign each trace in the Raw SEGY file to a channel defined in the 'Receiver Array'. The trace number in the SEGY header must match the channel number in InSite. By clicking Inspect after selecting a sample SEGY file, you can check the required channel numbers for importing the file. A report will be launched describing the structure and content of the SEGY file

SEGY V Data Properties Clear I	Directories	Compone	ent Directory:
Import Directory		G:\supp	ort\upsala\upsala\ Browse
G:\Webinar20200419\03-Leach\Raw SEGY\	Browse	<	ent Position = -9.9e+100
Automatically convert raw waveforms to ESF format			
SF Storage Directory		Available	disk space for ESFs:
G:\Webinar20200419\03-Leach\ESF\	Browse	401,401,	Scot me Report
alable data in Import Directory: Available data to select Traw data_0001.sgy Traw data_0002.sgy Traw data_0003.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0005.sgy Traw data_0011.sgy Traw data_0013.sgy Traw data_0013.sgy	for import:	ielect All MPORT-> Inspect	SECY File Header: Endon: Big, Mirzaces: 36, SampTime: 250, TraceLength: 16384, SampleFormat: 4 byte IEEE, Revision: 0, HAuxTraces: 0, N TraceNo: 1, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 3, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 3, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 5, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 5, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 5, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 7, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 7, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 7, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 9, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceDi: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250, Date: 25/11/2002, Time: 17:19:57, Delay: 0 TraceNo: 1, TraceLength: 16384, SampTime: 250,

Figure 8: Inspect report for SEGY files

7. If the channel numbers and the project is correctly set, you can now import all SEGY files by selecting the folder icon in the 'Available data in Import Directory' pane and clicking the '->IMPORT->' button. The imported 'Component' (group of events created by InSite based on import folder name) will show in the 'Project Components' pane

se this dialog box to update the Component data that	No Com	No Component Selected			
SEGY V Data Pro	Compo	nent Directory:			
import Directory				Browse	
G:\Webinar20200419\03-Leach\Raw SEGY\	1 5				
Automatically convert raw waveforms to ESF for	mat		Compo	onent Position = 0	
SF Storage Directory			Availabl	le disk space for ESFs:	
G:\Webinar20200419\03-Leach\ESF\					
Store ESFs in Component-delimited sub-directori	ies of the "ESF Storage	Directory"		Disk Space Critical Level (MBytes) = 100	
ailable data in Import Directory:	Available data to sele	ct for import:		Project Components:	
raw data 0001.sov	Data sub-directorie	s an ^	Select All		
araw data_0002.sgy	raw data_0001.s	gy D	->IMPORT->		
raw data_0004.sgy	raw data_0003.s	gy	Inspect		
raw data_0005.sgy	raw data_0004.s	gy 🗆			
□ raw data_0007.sgy	raw data_0006.s	gy			
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aw data_0009.sgy	raw data_0008.s	gy			
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and data_0014.sgy	raw data_0013.s	gy			
in a raw data 0015.sov		1000			
	raw data_0014.s	gy			

Figure 9: Completed import process in InSite's 'Data management' dialog

8. Once the process is completed, click 'Close' to return to the 'Data Visualiser' view of InSite. The data is imported and ready for visualisation and processing.