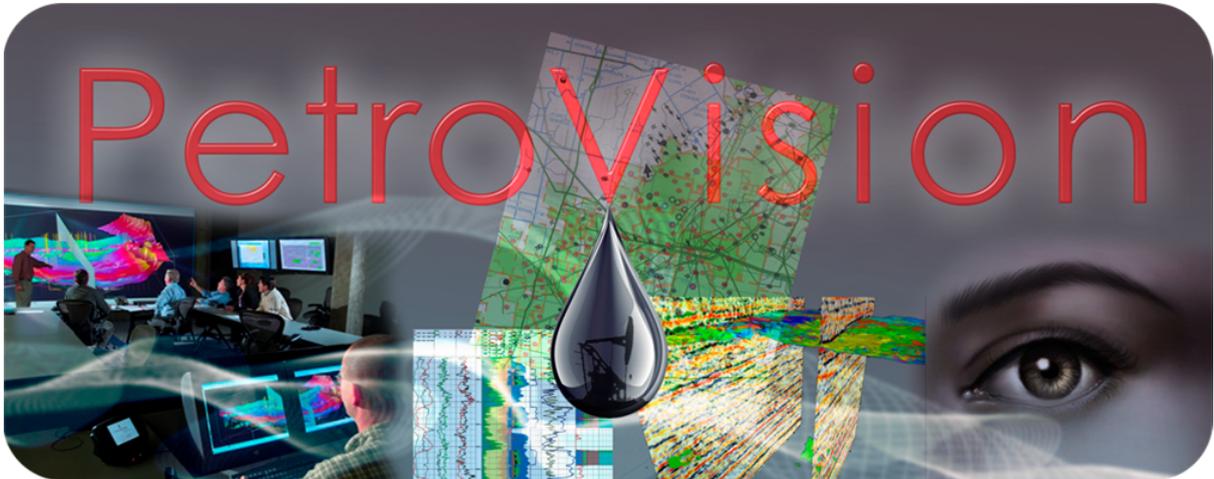


# SEG-Y Viewer



## *User Guide*

<b>Introduction</b>	<b>3</b>
<b>Launching SEG-Y Viewer</b>	<b>5</b>
<b>Functionality</b>	<b>6</b>
Control panel	7
Hide / Show Settings panel	7
"Schemes" dropdown menu	8
Show/Hide locator	8
Load line options	9
Reload image	9
Section	10
Headers	11
Settings panel	13
Annotations tab	13
Settings tab	15
Palette	16
Geophysical indicators:	17
Scale	19
Range of traces	19
Time range	19
Working with schemes	20
Save scheme	20
Schemes manager	20

## Introduction

*SEG-Y Viewer* is a companion utility for PetroVision designed for visual interpretation of seismic data. It can be used to view documents of the following formats:

1. *SEG-Y* files (can be written as *.sgy*, *.segy*, regardless of case):
  - 1.1. *seg-y rev 0* [<sup>1</sup>]
  - 1.2. *seg-y rev 1* [<sup>2</sup>]
  
2. *SEG-D* demultiplex files (can be written as *.segd*, *.sgd*, regardless of case):
  - 2.1. *seg-d rev 0* [<sup>3</sup>]
  - 2.2. *seg-d rev 1* [<sup>4</sup>]
  - 2.3. *seg-d rev 2* [<sup>5</sup>]
  - 2.4. *seg-d rev 3* [<sup>6</sup>]
  
3. Encapsulation formats:
  - 3.1. *Record oriented data encapsulation* format standard (***RODE***) [<sup>7</sup>]
  - 3.2. *Tape Image Format* (***TIF***)
  - 3.3. ***STAGE***

To support specialized formats, you can independently compose their description using the GeoSeisQC application or contact the support service of Geoleader company.

---

<sup>1</sup> [https://www.seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_y\\_rev0.pdf](https://www.seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_y_rev0.pdf)

<sup>2</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_y\\_rev1.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_y_rev1.pdf)

<sup>3</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_d\\_rev0.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_d_rev0.pdf)

<sup>4</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_d\\_rev1.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_d_rev1.pdf)

<sup>5</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_d\\_rev2.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_d_rev2.pdf)

<sup>6</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_d\\_rev3\\_1-oct2015.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_d_rev3_1-oct2015.pdf)

<sup>7</sup> [https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg\\_ode\\_w\\_segy.pdf](https://seg.org/Portals/0/SEG/News%20and%20Resources/Technical%20Standards/seg_ode_w_segy.pdf)

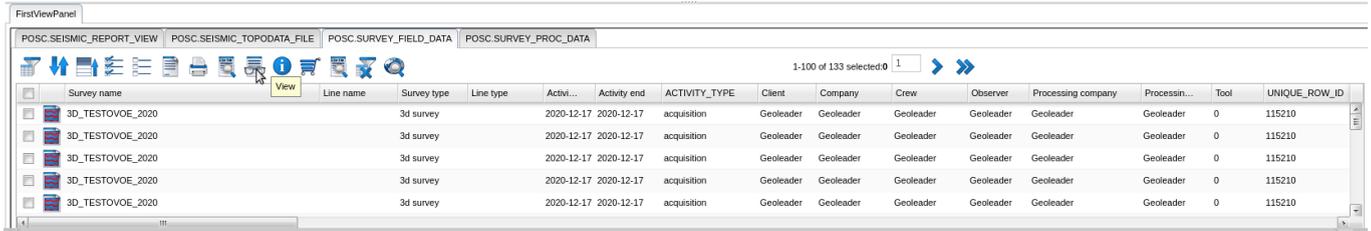
This application allows not only to display visual interpretation of seismic data, but also helps to customize their display according to the needs of the user. The application works with both 3D and 2D data.

Data visualization and analysis are conveniently organized with various settings for the following parameters:

- Color Schemes
- Geophysical parameters
- Scale
- Range of traces and times
- Viewing headers, etc.

## Launching SEG-Y Viewer

This application is a utility for viewing *.seg* and *.segd* documents and is available from the *PetroVision* web application. *SEG-Y Viewer* is launched automatically by double-clicking on documents of the specified formats or by using the icon:

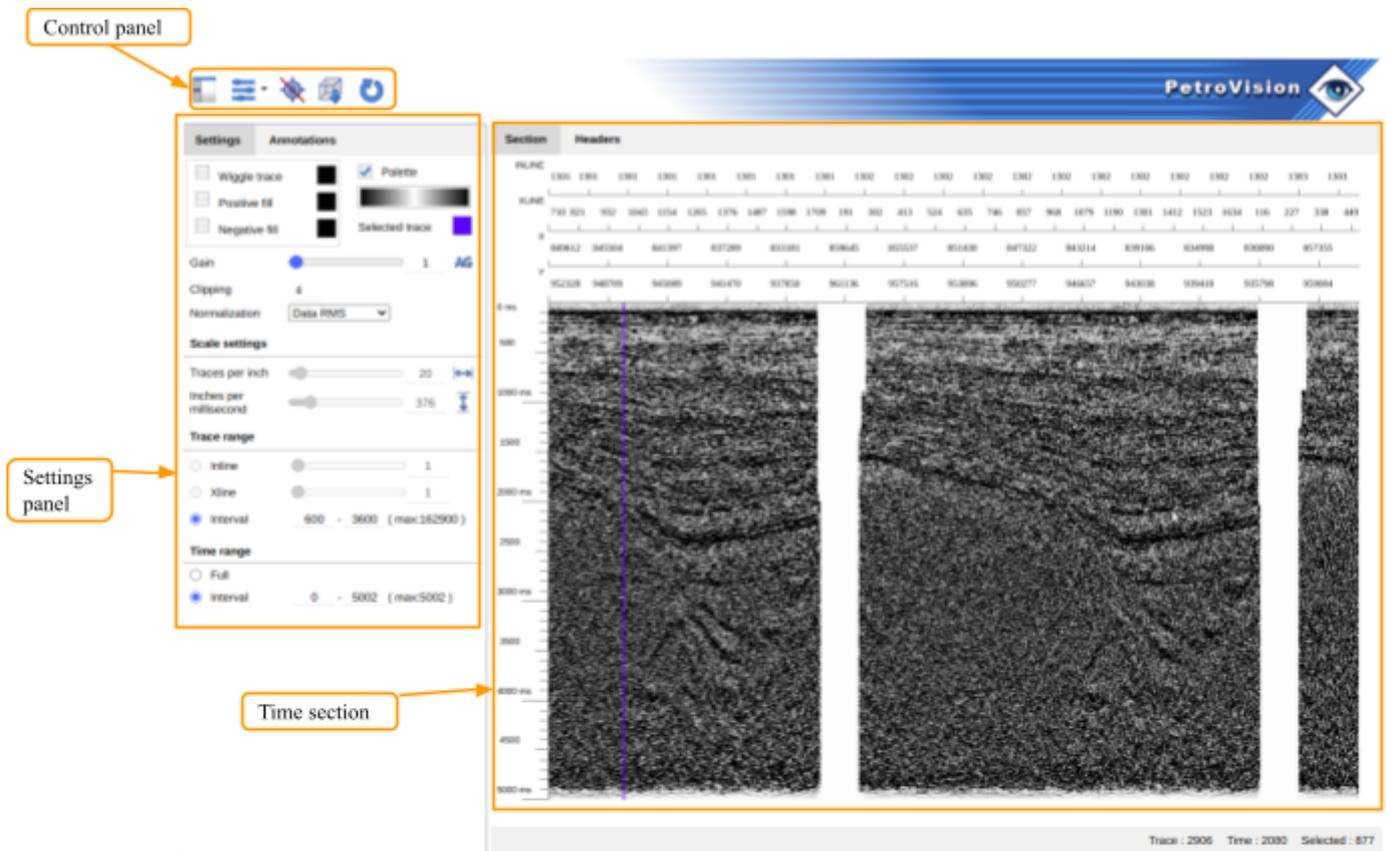


Survey name	Line name	Survey type	Line type	Activi...	Activity end	ACTIVITY_TYPE	Client	Company	Crew	Observer	Processing company	Processin...	Tool	UNIQUE_ROW_ID
3D_TESTOVOE_2020		3d survey		2020-12-17	2020-12-17	acquisition	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	0	115210
3D_TESTOVOE_2020		3d survey		2020-12-17	2020-12-17	acquisition	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	0	115210
3D_TESTOVOE_2020		3d survey		2020-12-17	2020-12-17	acquisition	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	0	115210
3D_TESTOVOE_2020		3d survey		2020-12-17	2020-12-17	acquisition	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	Geoleader	0	115210

## Functionality

The functionality of the *SEG-Y Viewer* application includes several blocks:

- Control panel
- Settings panel with “Settings” and “Annotations” tabs
- Window with the display of the time section - "Section"
- Window of common headers and trace headers - "Headers"



Below you will find a detailed description of each of the listed blocks.

## Control panel

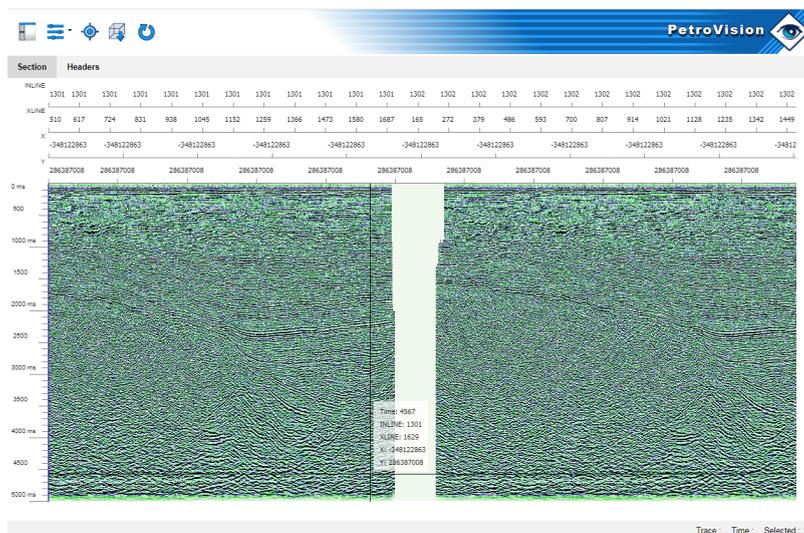
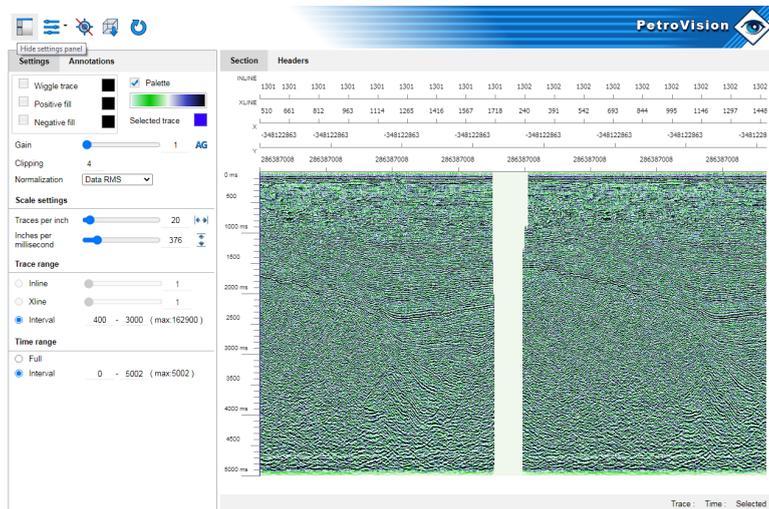
The Control panel is located in the upper left corner of the application. It consists of the following buttons:



### ☐ Hide / Show Settings panel



This button allows you to focus exclusively on data display in the "Section" window or to be able to work with its settings;



❑ "Schemes" dropdown menu 

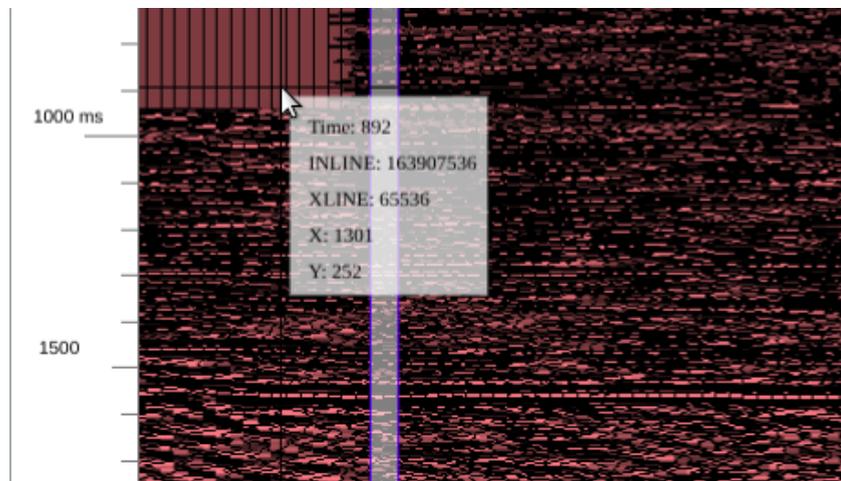
Scheme is a set of settings that is applied to the time section at a particular moment of work.

The application provides an ability to select and save various scheme settings for a more accurate display of the time section: geophysical parameters, visual settings, scale and annotations.

Working with the list of the drop-down "Schemes" menu is described in detail below in the paragraph "Working with schemes"

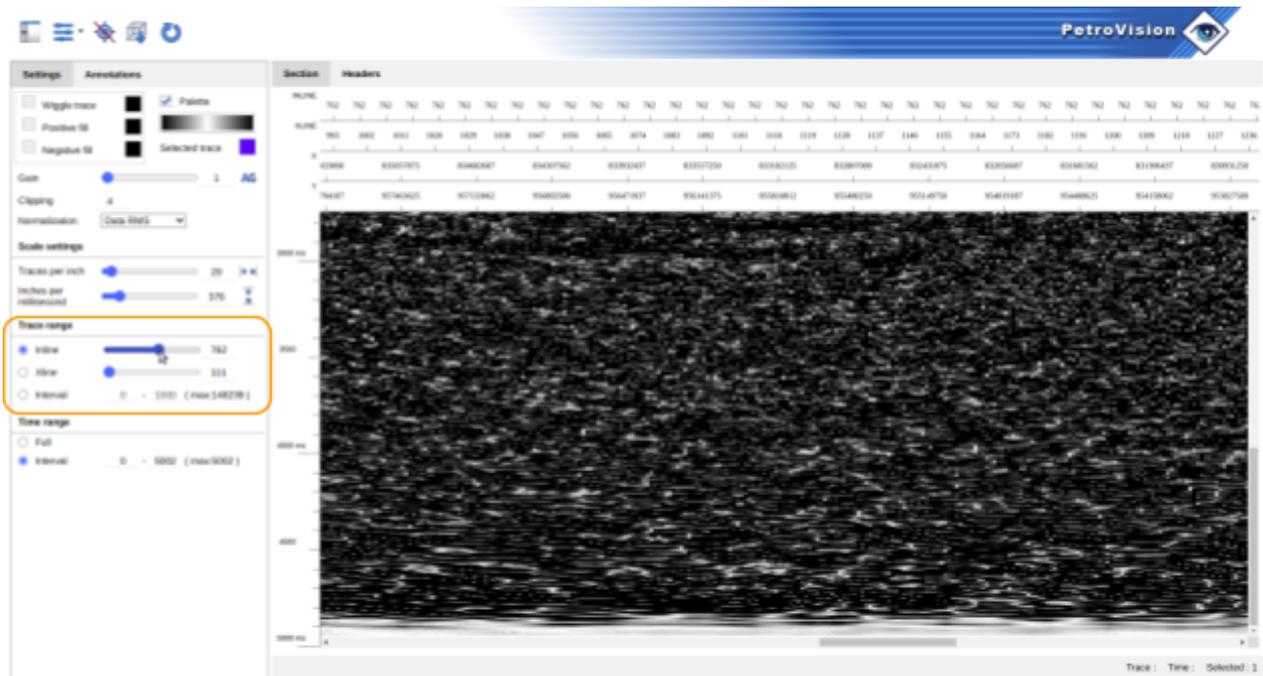
❑ Show/Hide locator 

The locator is a display of data about time and selected parameters from the "Annotations" tab belonging to the point on the trace where the cursor is currently located.



❑ Load line options 

If the positions of annotation parameters are correctly set, this button loads information about the Inline and Xline parameters from the file. After that, it becomes possible to view the data slice for a single Inline or Xline parameter;



❑ Reload image 

Allows you to redraw the image to apply the default settings, settings for the selected scheme, or manually set settings.

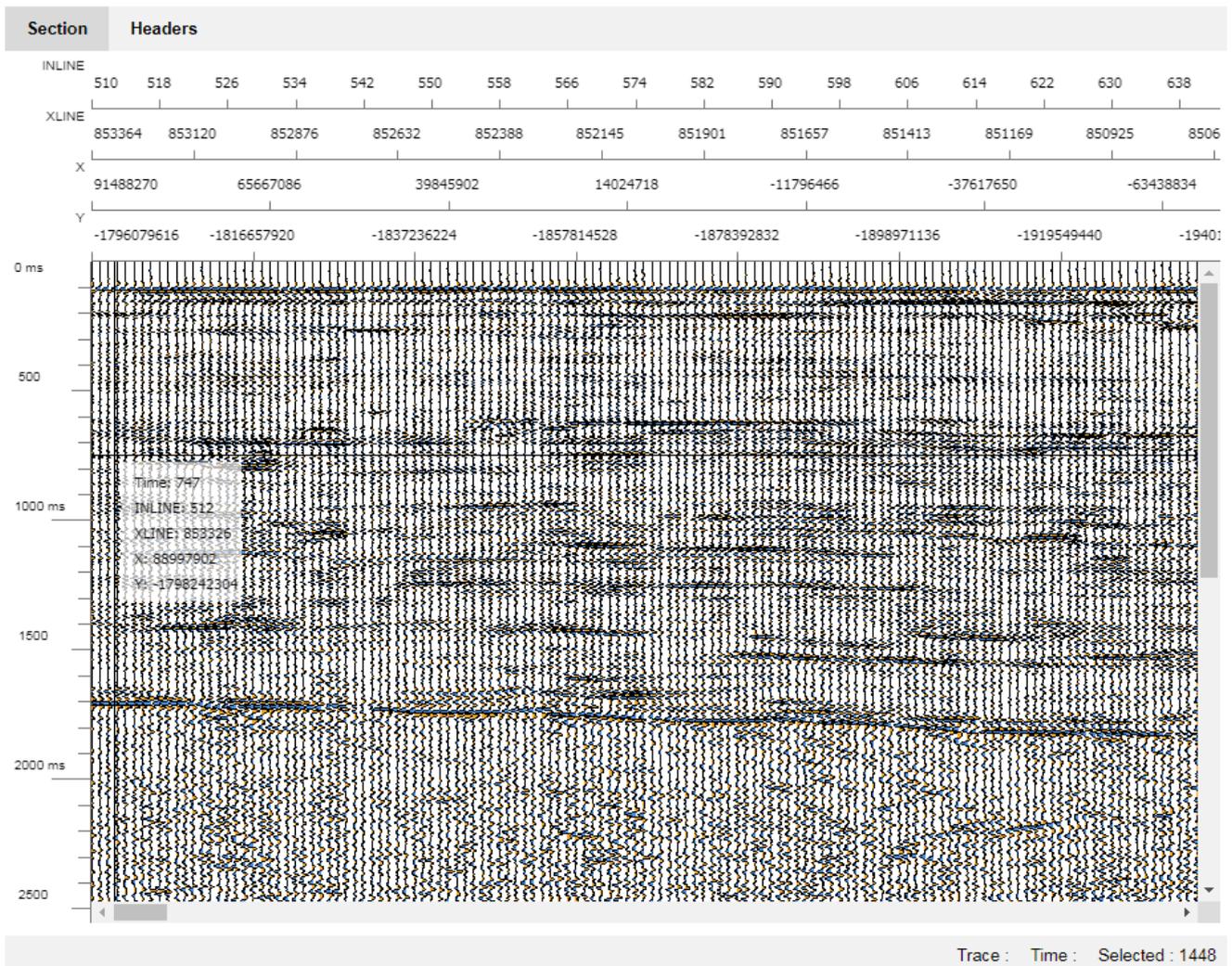
## Section

The "Section" window is an image of a section with a Time scale along the ordinate axis.

Three parameters are displayed in the lower right corner of the window: Trace, Time, Selected. They show the number of the highlighted trace and the Time/Trace values for the position at which the cursor is currently located.

The selected trace display settings have been applied to the image. Also, the image has a scale, trace range and time range. Each of the listed settings can be changed in the "Settings" panel.

Above the image of the section, the data on the parameters are shown, the display of which can be edited on the "Annotations" tab. If there are more than four of these parameters, they can be viewed using the scroll bar.



## Headers

The Headers window displays all available header information.

For *SEG-Y* and *SEG-D* documents, there is a trace header that refers to the specific trace selected in the section.

This window shows data for the trace selected in the viewing area and implements an ability to switch the trace with the counter. Similarly, you can write the trace number manually - the header data will be recalculated automatically.

Section
Headers

Select header : Trace Header Trace#: 13

POSITION	NAME	VALUE
1-4	Trace sequence number within line	13
5-8	Trace sequence number within file	13
9-12	Original field record number	105
13-16	Trace number in original record	380
17-20	Energy source point number	0
21-24	Ensemble number	-1042022400
25-28	Trace number in this ensemble	0
29-30	Trace identification code	1
31-32	No of vertically summed traces	0
33-34	No of horizontally stacked traces	0
35-36	Data use	1
37-40	Offset	935
41-44	Receiver group elevation	0
45-48	Surface elevation at source	0
49-52	Source depth below surface	0
53-56	Datum elevation at receiver group	0
57-60	Datum elevation at source	0
61-64	Water depth at source	0
65-68	Water depth at group	0
69-70	Scalar for elevations and depths	0
71-72	Scalar for coordinates	0
73-76	Source coordinate - X	758686
77-80	Source coordinate - Y	6612030
81-84	Group coordinate - X	767020

Trace : Time : Selected : 13

For *SEG-D* files, the structure can initially include specialized headers, they are also available in the drop-down menu. In most cases, such data are independent of a specific trace and refer to the entire document as a whole.

In addition to the trace header for *SEG-Y* documents, in the drop-down menu you can select:

- Text header - to view the attributive information associated with the file (year of creation, manufacturer, area, etc.)

Section	Headers
Select header : <span style="border: 1px solid #ccc; padding: 2px;">Textual File Header ▼</span>	
C01 C03 C04 C05 C06 C02 C03 C04 C05 C08 C10 C11 C12 C13 C14 C14 C15 C16 C17 C18 C19	<pre>           AREA                : 3D_SEVERNOE_2009           SURVEY TYPE         : 3d survey           BLOCK ACTIVITY TYPE : processing           DATE ACTIVITY START : 2009-02-13           DATE ACTIVITY END   : 2009-06-13           CLIENT              : Geoleader           CONTRACTOR         : Geoleader           DESCRIPTION        : ADPAM- MISHKINSKOE           LENGTH 4000, SAMPLE 4, FORMAT IBM 32, SORT CDP           DCDP               : 25           HEADER CONTENTS:           NLINE IN BITES     :189-192           NCRLINE IN BYTES   :193-196           CDP ABSCISSA (X) IN BYTES :181-184           CDP ORDINATE (Y) IN BYTES :185-188           FILE FORMAT        :SEGY           1Point IL, XL, CDP(X), CDP(Y):105,101,229333,6608431           2Point IL, XL, CDP(X), CDP(Y):444,101,205899,6689300           3Point IL, XL, CDP(X), CDP(Y):444,680,229118,6688771           4Point IL, XL, CDP(X), CDP(Y):105,680,228552,6663902         </pre>

- Binary header - to display information directly related to the data (number of traces, number of samples in a trace, etc.)

Section	Headers																																																																											
Select header : <span style="border: 1px solid #ccc; padding: 2px;">Binary File Header ▼</span>																																																																												
1-4 5-8 9-12 13-14 15-16 17-18 19-20 21-22 23-24 25-26 27-28 29-30 31-32 33-34 35-36 37-38 41-42 43-44 45-46 49-50 51-52 53-54 55-56 57-58	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">POSITION</th> <th style="width: 60%;">NAME</th> <th style="width: 20%;">VALUE</th> </tr> </thead> <tbody> <tr><td>1-4</td><td>Job ID</td><td>0</td></tr> <tr><td>5-8</td><td>Line</td><td>105</td></tr> <tr><td>9-12</td><td>Reel</td><td>29</td></tr> <tr><td>13-14</td><td>Data Traces per Record</td><td>0</td></tr> <tr><td>15-16</td><td>Aux Traces per Record</td><td>0</td></tr> <tr><td>17-18</td><td>Sample Rate (us) this reel</td><td>4000</td></tr> <tr><td>19-20</td><td>Sample Rate (us) original</td><td>4000</td></tr> <tr><td>21-22</td><td>Traces/Sample this reel</td><td>750</td></tr> <tr><td>23-24</td><td>Traces/Sample original</td><td>750</td></tr> <tr><td>25-26</td><td>Data Format</td><td>3</td></tr> <tr><td>27-28</td><td>CDP Fold</td><td>0</td></tr> <tr><td>29-30</td><td>Trace sort code</td><td>0</td></tr> <tr><td>31-32</td><td>Vertical Sum Code</td><td>0</td></tr> <tr><td>33-34</td><td>Sweep Frequency at start</td><td>0</td></tr> <tr><td>35-36</td><td>Sweep Frequency at end</td><td>0</td></tr> <tr><td>37-38</td><td>Sweep length (msec)</td><td>0</td></tr> <tr><td>41-42</td><td>Trace number of sweep channel</td><td>0</td></tr> <tr><td>43-44</td><td>Sweep trace taper length at start</td><td>0</td></tr> <tr><td>45-46</td><td>Sweep trace taper length at end</td><td>0</td></tr> <tr><td>49-50</td><td>Correlated data traces</td><td>0</td></tr> <tr><td>51-52</td><td>Binary gain recovered</td><td>0</td></tr> <tr><td>53-54</td><td>Sweep length (msec)</td><td>0</td></tr> <tr><td>55-56</td><td>Measurement system</td><td>1</td></tr> <tr><td>57-58</td><td>Impulse signal polarity</td><td>0</td></tr> </tbody> </table>	POSITION	NAME	VALUE	1-4	Job ID	0	5-8	Line	105	9-12	Reel	29	13-14	Data Traces per Record	0	15-16	Aux Traces per Record	0	17-18	Sample Rate (us) this reel	4000	19-20	Sample Rate (us) original	4000	21-22	Traces/Sample this reel	750	23-24	Traces/Sample original	750	25-26	Data Format	3	27-28	CDP Fold	0	29-30	Trace sort code	0	31-32	Vertical Sum Code	0	33-34	Sweep Frequency at start	0	35-36	Sweep Frequency at end	0	37-38	Sweep length (msec)	0	41-42	Trace number of sweep channel	0	43-44	Sweep trace taper length at start	0	45-46	Sweep trace taper length at end	0	49-50	Correlated data traces	0	51-52	Binary gain recovered	0	53-54	Sweep length (msec)	0	55-56	Measurement system	1	57-58	Impulse signal polarity	0
POSITION	NAME	VALUE																																																																										
1-4	Job ID	0																																																																										
5-8	Line	105																																																																										
9-12	Reel	29																																																																										
13-14	Data Traces per Record	0																																																																										
15-16	Aux Traces per Record	0																																																																										
17-18	Sample Rate (us) this reel	4000																																																																										
19-20	Sample Rate (us) original	4000																																																																										
21-22	Traces/Sample this reel	750																																																																										
23-24	Traces/Sample original	750																																																																										
25-26	Data Format	3																																																																										
27-28	CDP Fold	0																																																																										
29-30	Trace sort code	0																																																																										
31-32	Vertical Sum Code	0																																																																										
33-34	Sweep Frequency at start	0																																																																										
35-36	Sweep Frequency at end	0																																																																										
37-38	Sweep length (msec)	0																																																																										
41-42	Trace number of sweep channel	0																																																																										
43-44	Sweep trace taper length at start	0																																																																										
45-46	Sweep trace taper length at end	0																																																																										
49-50	Correlated data traces	0																																																																										
51-52	Binary gain recovered	0																																																																										
53-54	Sweep length (msec)	0																																																																										
55-56	Measurement system	1																																																																										
57-58	Impulse signal polarity	0																																																																										

Trace : Time : Selected : 13

## Settings panel

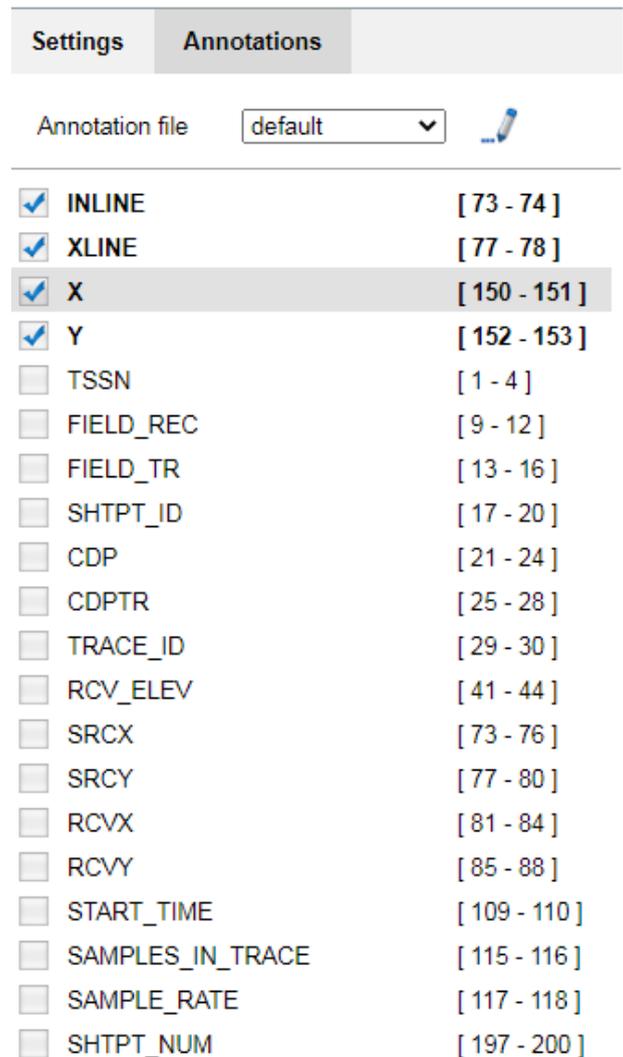
This panel is represented by two tabs: Settings and Annotations

### Annotations tab

Annotation is a set of section characteristics extracted from trace headers from a given position in a document of a certain format.

This tab provides the ability to select parameters that are displayed above the image on the "Section" tab.

When the "Locator" option is enabled, all values of the selected parameters related to the time/trace intersection point will also be shown.



Settings	Annotations
Annotation file: default 	
<input checked="" type="checkbox"/>	INLINE [ 73 - 74 ]
<input checked="" type="checkbox"/>	XLINE [ 77 - 78 ]
<input checked="" type="checkbox"/>	X [ 150 - 151 ]
<input checked="" type="checkbox"/>	Y [ 152 - 153 ]
<input type="checkbox"/>	TSSN [ 1 - 4 ]
<input type="checkbox"/>	FIELD_REC [ 9 - 12 ]
<input type="checkbox"/>	FIELD_TR [ 13 - 16 ]
<input type="checkbox"/>	SHTPT_ID [ 17 - 20 ]
<input type="checkbox"/>	CDP [ 21 - 24 ]
<input type="checkbox"/>	CDPTR [ 25 - 28 ]
<input type="checkbox"/>	TRACE_ID [ 29 - 30 ]
<input type="checkbox"/>	RCV_ELEV [ 41 - 44 ]
<input type="checkbox"/>	SRCX [ 73 - 76 ]
<input type="checkbox"/>	SRCY [ 77 - 80 ]
<input type="checkbox"/>	RCVX [ 81 - 84 ]
<input type="checkbox"/>	RCVY [ 85 - 88 ]
<input type="checkbox"/>	START_TIME [ 109 - 110 ]
<input type="checkbox"/>	SAMPLES_IN_TRACE [ 115 - 116 ]
<input type="checkbox"/>	SAMPLE_RATE [ 117 - 118 ]
<input type="checkbox"/>	SHTPT_NUM [ 197 - 200 ]

The user can also edit the annotation file.

For each parameter, you can select the type (*INT 2* or *INT 4*) and set its position in the trace header. The description for each of the parameters can be written manually and saved. The first four parameters are key and are not available for deleting and editing the Name.

To add a new annotation or delete a selected one, you need to right-click on the editing window.

Edit annotation file

Annotation file

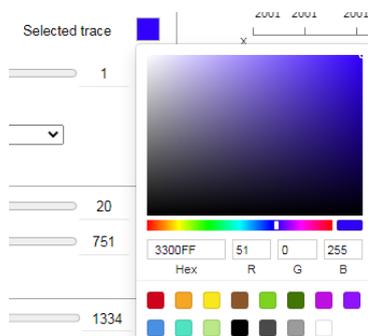
NAME	TYPE	FIRST BYTE	LAST BYTE	DESCRIPTION
<b>INLINE</b>	INT4 ▼	73	76	<b>Inline number</b>
<b>XLIN</b>	INT4 ▼	77	80	<b>Xline number</b>
<b>X</b>	INT4 ▼	193	196	
<b>Y</b>	INT4 ▼	197	200	
TSSN	INT4 ▼	1	4	Trace sequence number within line
FIELD_REC	INT4 ▼	9	12	Original field record number
FIELD_TR	INT4 ▼	13	16	Trace number within the original field re
SHTPT_ID	INT4 ▼	17	20	
CDP	INT4 ▼	21	24	CDP ensemble number
CDPTR	INT4 ▼	25	28	Trace number within the CDP ensemble
TRACE_ID	INT2 ▼	29	30	Trace identification code
RCV_ELEV	INT4 ▼	41	44	Receiver group elevation
SRCX	INT4 ▼	73	76	Source coordinate X
SRCY	INT4 ▼	77	80	Source coordinate Y
RCVX	INT4 ▼	81	84	
RCVY	INT4 ▼	85	88	
START_TIME	INT4 ▼	109	110	
SAMPLES_IN_TRACE	INT2 ▼	115	116	Number of samples in this trace
SAMPLE_RATE	INT2 ▼	117	118	
SHTPT_NUM	INT4 ▼	197	200	

Save Cancel

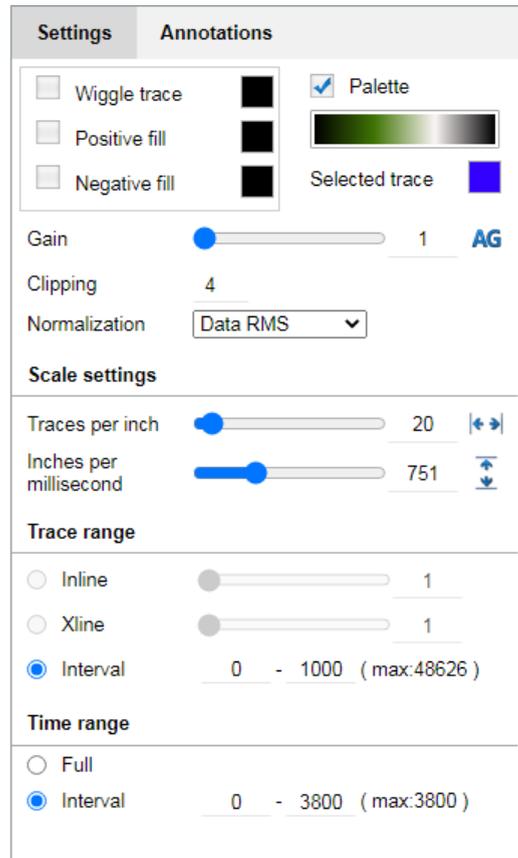
## Settings tab

This tab is used to directly adjust the time section image with user-defined settings for schemes.

The ability to customize the color of the Selected trace is implemented with a mouse click.

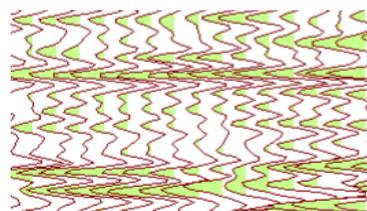
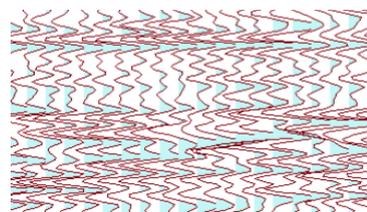
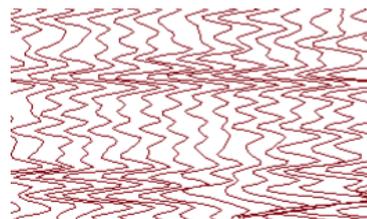


When choosing a color for any of the parameters, it is possible to adjust the transparency.



Similarly, here you can adjust the color, as well as show/hide the display of the following parameters:

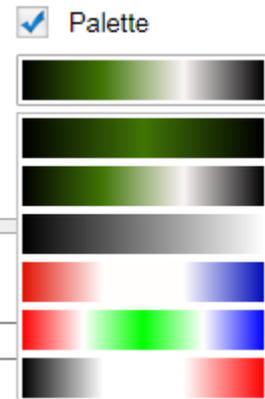
- Trace Curve - a full view of each trace
- Positive phase - color filling of positive trace values
- Negative phase - similar filling of negative values



## Palette

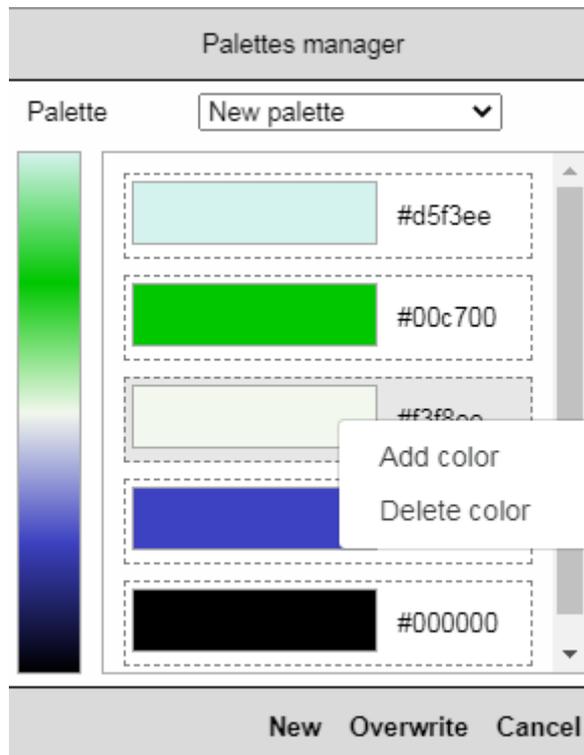
Palette - gradient highlighting depending on the trace value in a time interval of 2 ms.

The option to show/hide the Palette is available in the Settings tab, as well as the choice of color schemes in the drop-down menu



To edit an existing palette or add a new one, you need to:

1. On the Control panel, click the "Schemes" button
2. In the drop-down menu select "Palettes manager"
3. Create a new palette or edit and save the current one.



You can add or remove a color by right-clicking in the Palettes manager pop-up window.

Geophysical indicators:

→ **Normalization type**

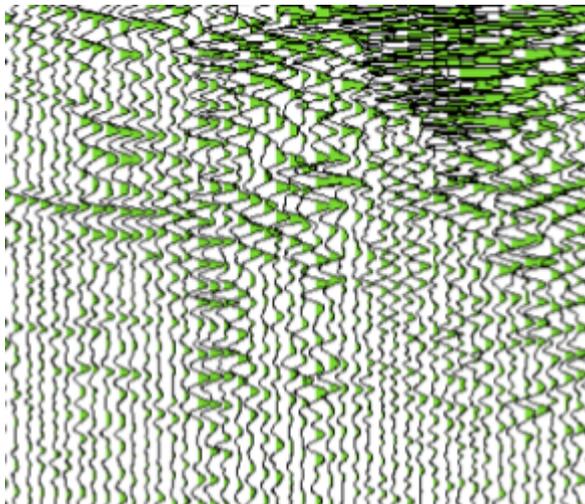
Dropdown menu with the following list of normalizations:

- Trace maximum
- Trace average
- Data maximum
- Data average
- Trace RMS
- Data RMS
- Range

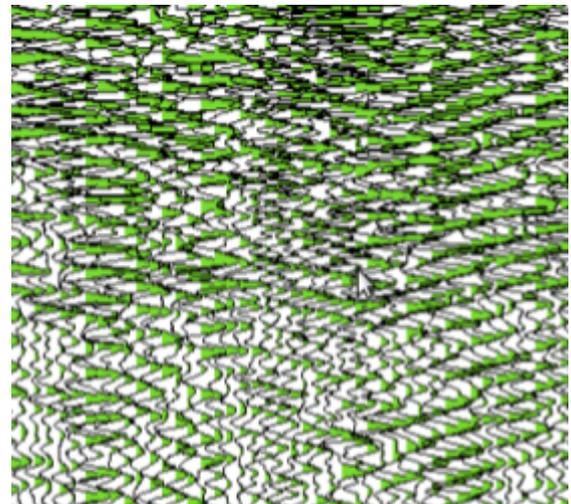
→ **Gain** - the coefficient by which the trace values are multiplied for a more pronounced visualization of the trace curve behavior

**AG** (Auto Gain) this button sets the recommended gain value based on the calculated data.

You can also set the parameter using the slider or change the value manually.



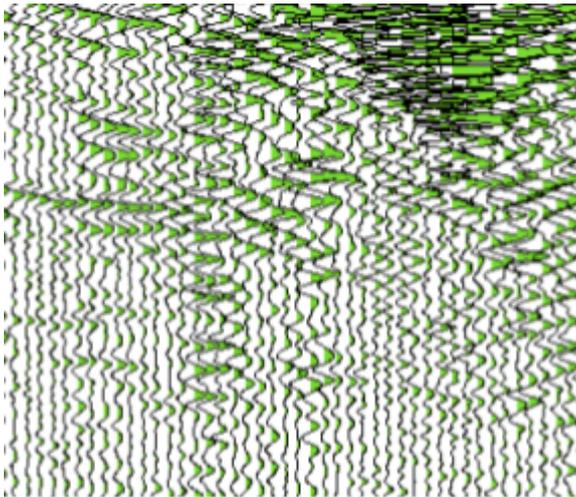
AG, Gain = 1



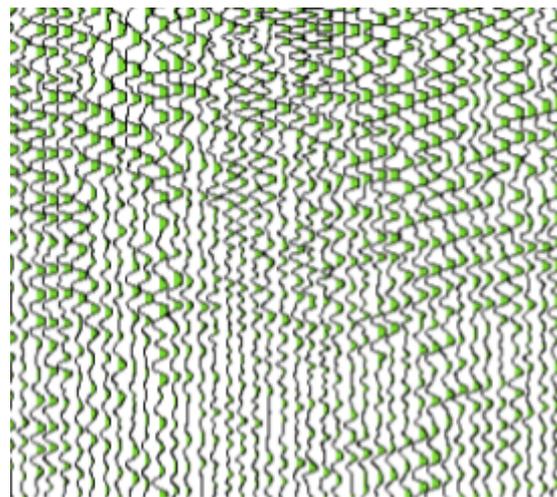
Gain = 3

→ **Clipping** is the coefficient for limiting trace values. It is applied in such a way that the trace values do not intersect the number of traces greater than the halving value.

Can be changed with a counter or manually;



Clipping = 4



Clipping = 1

## Scale

The number of traces and milliseconds that will be included in the inch of the image. It can be set with a slider or manually.

There are also the following scaling functions:

- Fit image to width 
- Fit image to height 

They allow you to fit the image into the display area and view it in its entirety, without resorting to scroll bars.

## Range of traces

The ability to select a section for a specific value of *Inline* or *Xline*. It becomes available only when loading line data and a correctly configured annotation file. After that, the selection of the value can be changed with the slider or manually.

You can also view the interval of trace values here. In this case, trace values are set only manually.

## Time range

Possibility to choose the display of "Full length" on the time scale or a specific interval of time values, which, in turn, are set manually.

The maximum value for spacing is shown alongside in parentheses. It is not possible to set a value for the interval higher than the maximum.

---

## Working with schemes

### Save scheme

Any settings other than gain, clipping, and ranges can be saved as a scheme.

To do this, click on the “Schemes” drop-down menu on the Control panel and select “Save scheme”. In the “Save scheme dialogue” pop-up window that opens, you can overwrite the existing scheme or, by changing the Scheme name, save it as a new one.

### Schemes manager

Using the Schemes manager button, you can select and apply any of the available Schemes.

They are displayed in the Schemes manager pop-up window as:

Schemes manager	
default	admin
blue_red_yellow_scheme	admin
default_segd	admin
✓ default	4545
Deleted schemes:	
default12	4545
default1	4545
Restore Delete Apply Cancel	

There is also a delete function for schemes created by your user. Within one session, deleted schemes can be restored without loss.