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Filter Options

Moving average, Round off, Scaling, Smoothing,

Single spike filter and Set sampling rate

Select a SDX file and click the **Filter Signal** button 

The following options appear:

Figure 1 Filter Signal

All the filter options result in a new SDX file where the filtered signal is displayed and the difference between the original SDX signal and the filtered signal can be viewed. The difference signal can be accessed through the **Active series** button on the chart bar.

Moving average

Moving average is an efficient method to even out large irregularities in the signal. It is especially useful when preparing a signal for behavioral event analysis.

Click the **Filter Signal** button and select **Moving average**. The following window appears:

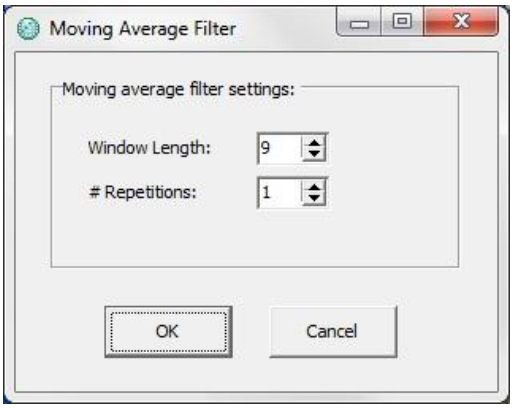

Figure 2 Moving Average Filter

Under **Window Length** define the size of the window, i.e., the number of measurement values. The minimum is 3 values.

Under **Repetitions** define how often the procedure is to be carried out.

Click **OK** and the following chart appears:

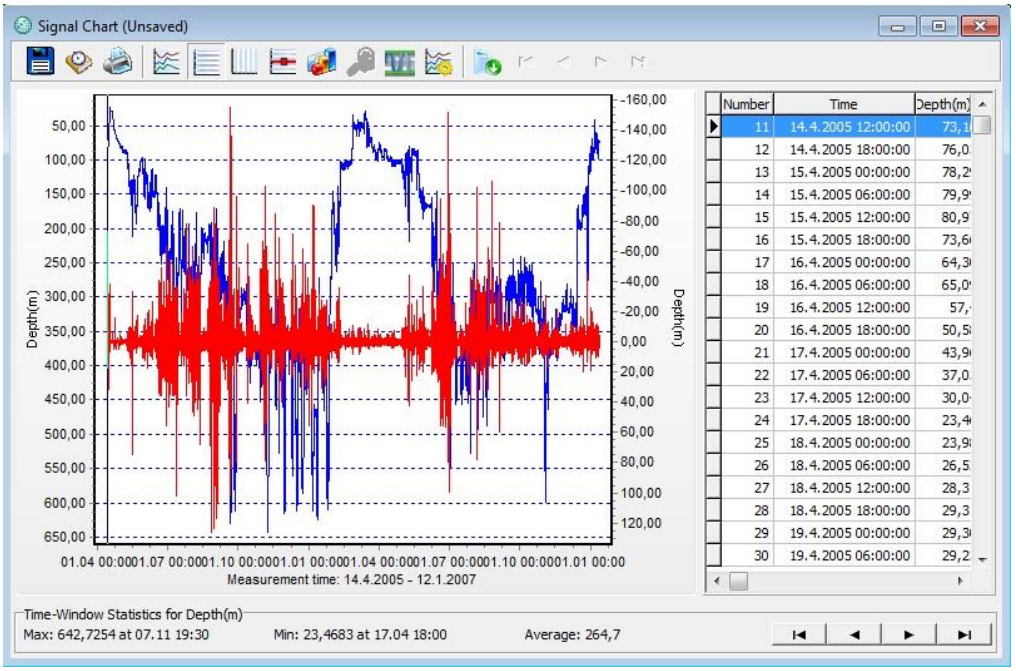

Figure 3 Signal chart

Click the **Histogram** button  on the chart bar and select **Difference**. The histogram shows that **Moving average** mainly targets relatively small amplitude variations (see figure 4).

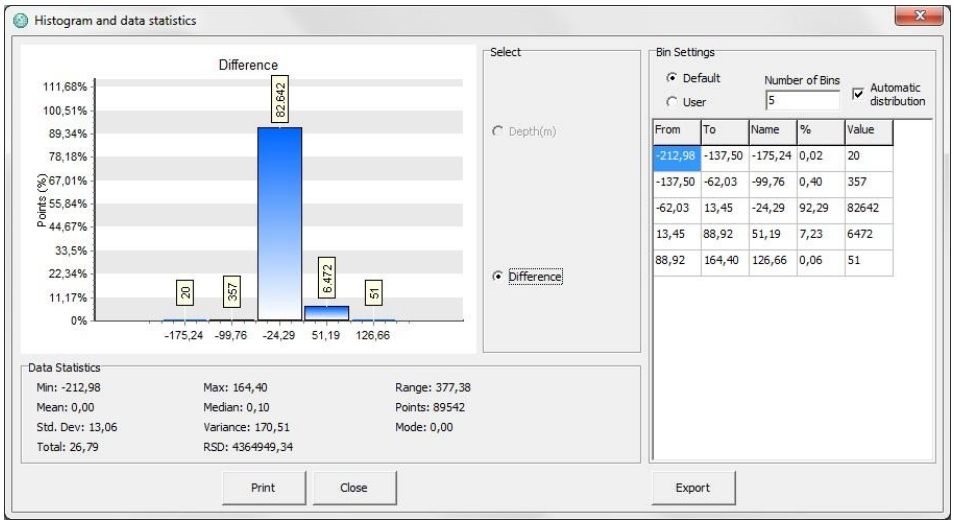

Figure 4 Histogram

Note that **Moving Average** inevitably results in amplitude distortion and time shifting. **PF** automatically corrects the time shift in the resulting signal.

Round Off

Round off is used, for example, when preparing a signal for ambient/level event analysis.

Click the **Filter Signal** button and select **Round off**. The following window appears:

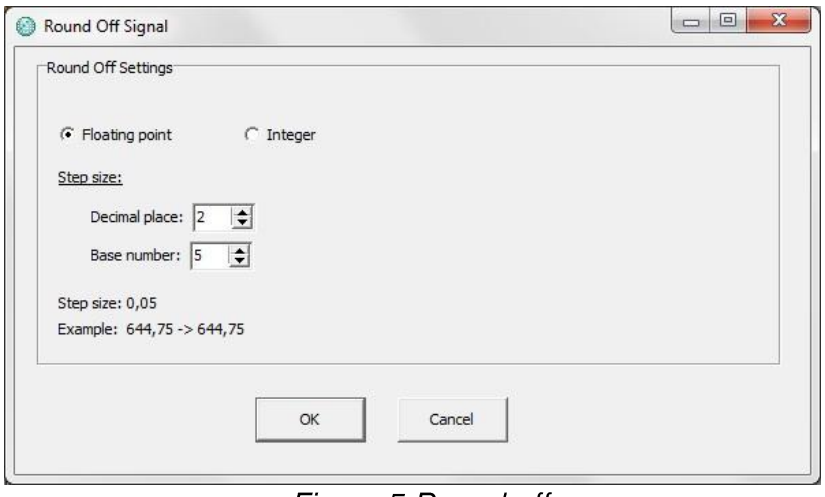

Figure 5 Round off

The user can choose between **Floating point** and **Integer**.

Floating point

By selecting **Floating point** you can filter the decimal values. This can be useful when working with low bar values where the decimals play a significant role. First you select the decimal place you want to work with. In the test file, the second decimal place has been selected (see figure 5).

Secondly, select the **Base number**. The **Base number** defines the resolution of the selected decimal. In this case, we have selected 5 which will give us a 2 decimal value where the last decimal will always be 0 or 5 (see figure 5).

Click **OK** and the following chart appears:

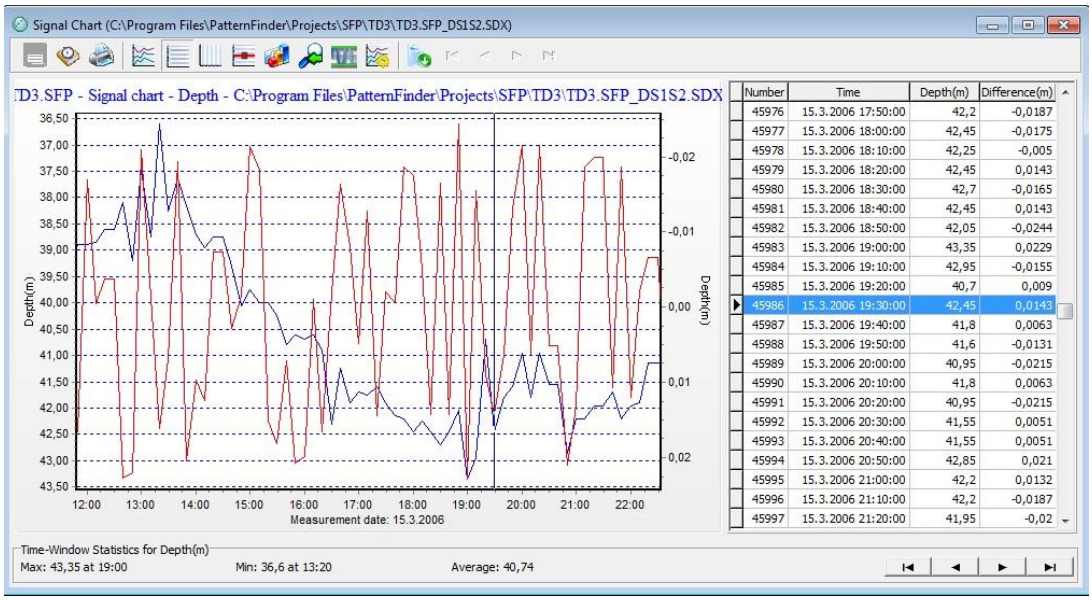

Figure 6 Round off: Floating point

Integer

The **Integer** round off is useful, for example, when preparing a signal for ambient analysis where you want to decrease the number of events around the level values.

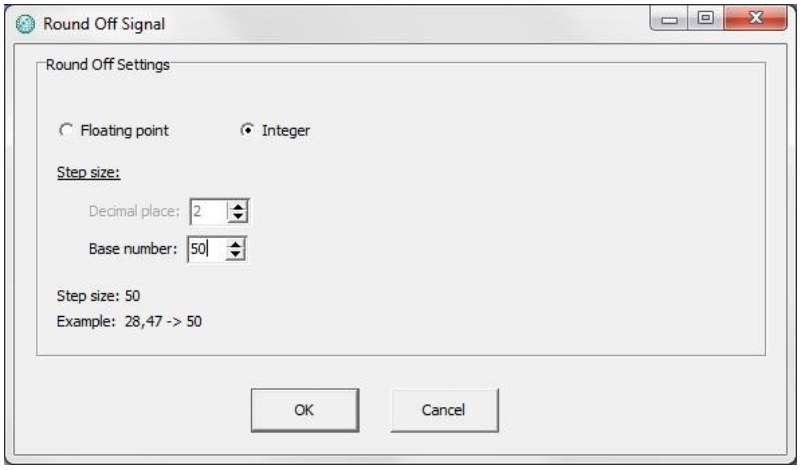

Figure 7 Round off

When selecting **Integer**, the decimal values are rounded off. The integer values can be rounded down to a **Base number** defined in the unit values of the signal (m, °C, etc.). In this case the **Base number** has been set at 50 which will give us 50m steps.

Click **OK** and the following chart appears:

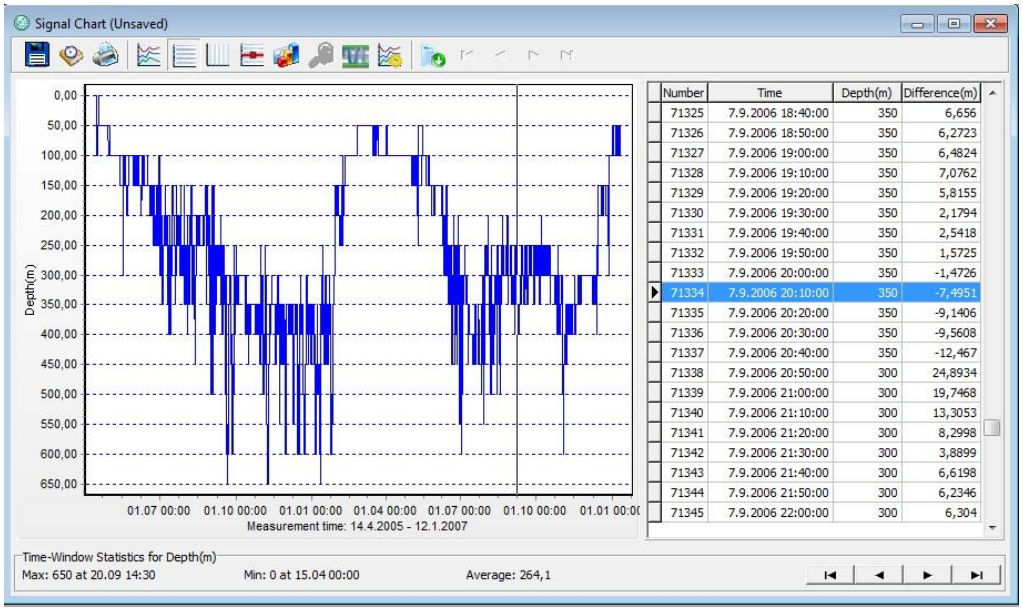

Figure 8 Round off: Integer

Scale

Click the **Filter Signal** button and select **Scale**. The following window appears:

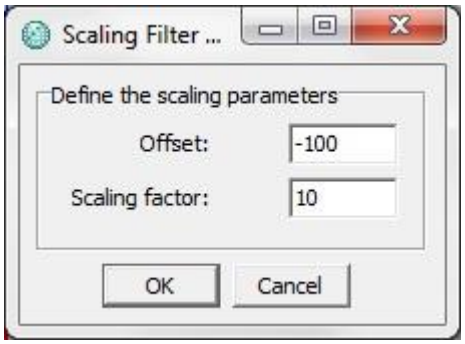

Figure 9 Scale

Offset

Offset values can be used to compensate for a known offset in the measurement signal. You can add or subtract a value by adding a + or – in front of the number. The offset is defined in the unit value of the signal (m, °C, etc.). Note that you can use decimal values.

In the test file we have offset the measurement signal by -100m (see figure 9).

Scaling factor:

Scaling factor multiples the signal after the offset has been applied.

In the test file the signal has been multiplied by 10 (see figure 9). Note that you can use decimals values.

Click **OK** and the following chart appears:

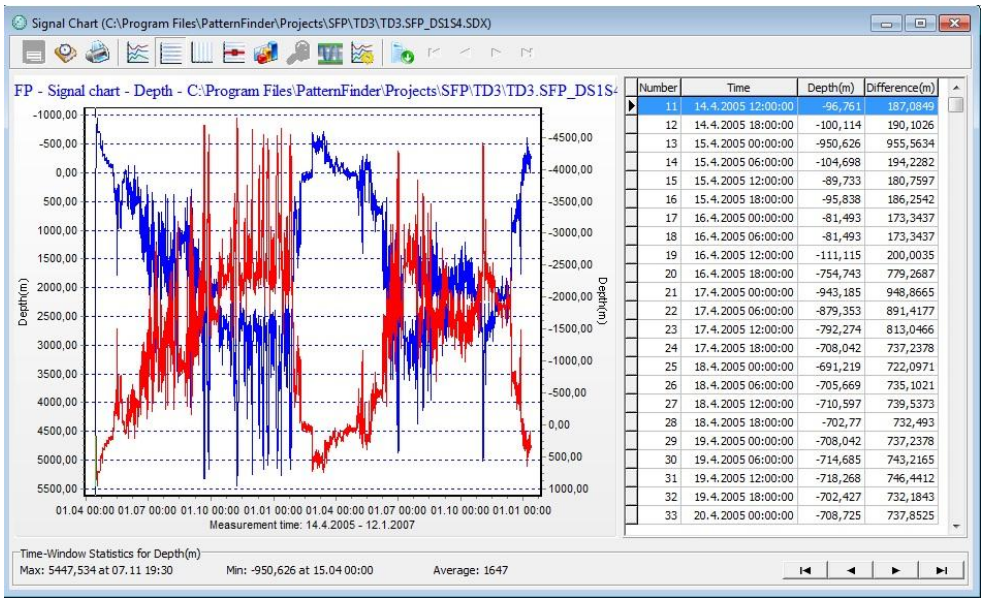

Figure 10 Scale

Smoothing

Data smoothing is primarily used to reduce low-level noise in the measurement. It can also be used to prepare the signal before finding behavioral events and patterns.

Note that **Smoothing** does not distort or time-shift the signal

Click the **Filter Signal** button and select **Smoothing**. The following window appears:

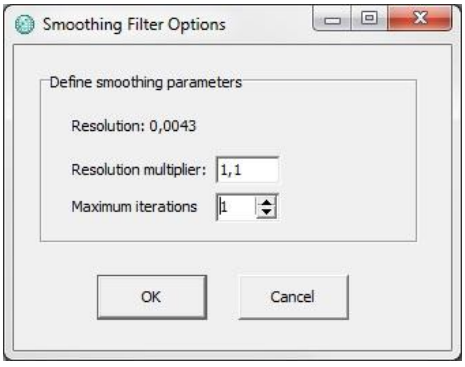

Figure 11 Smoothing

Under **Resolution** define the minimum difference between two aligning measurements.

Under **Resolution multiplier** you can multiple the resolution

Under **Maximum iterations** you can define the number of iterations, i.e. how many times the smoothing operation is performed.

Click **OK** and the following chart appears:

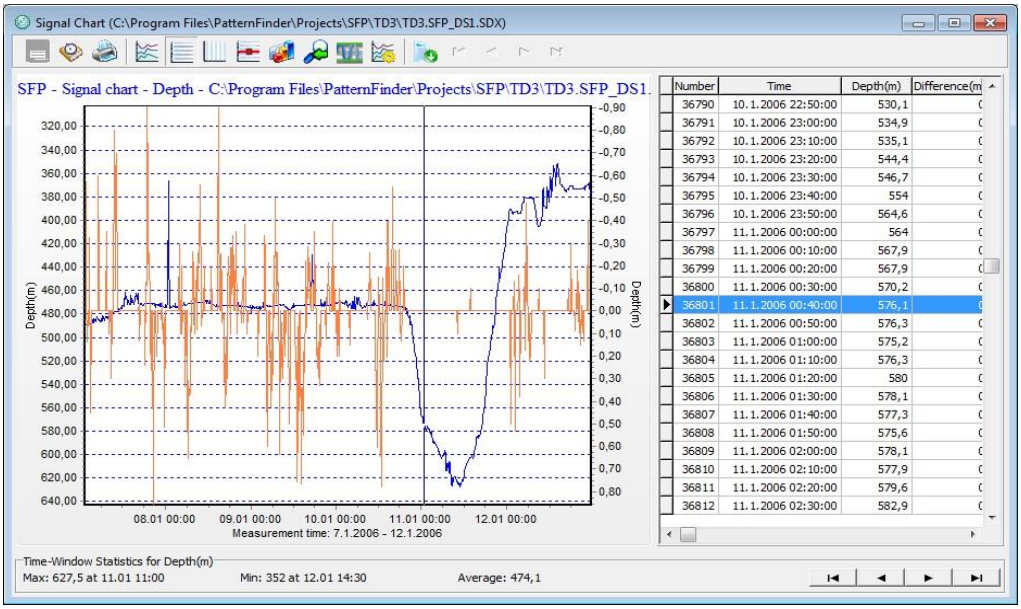

Figure 12 Smoothing

Signal Spike Filter

Signal Spike Filter is used to remove erroneous spikes in a signal as well as preparing a signal for pattern identification.

Click the **Filter Signal** button and select **Single Spike Filter**. The following window appears:

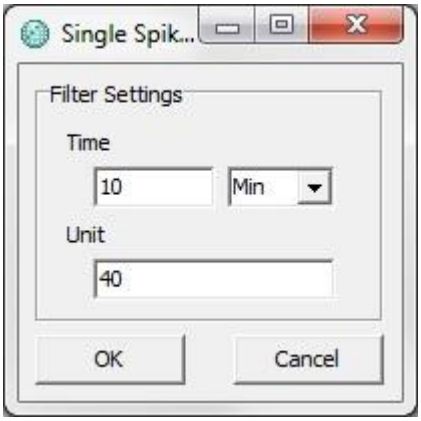

Figure 13 Single Spike Filter

Under **Time** define the maximum duration of the spike (sec, min or hours). Under **Unit** define the minimum amplitude in the signal unit value of the spike.

In the test file a 10min interval, which happens to be the sampling interval of the signal, was defined and 40m amplitude (see figure 13).

Both positive and negative spikes are removed.

Click **OK** and the following chart appears:

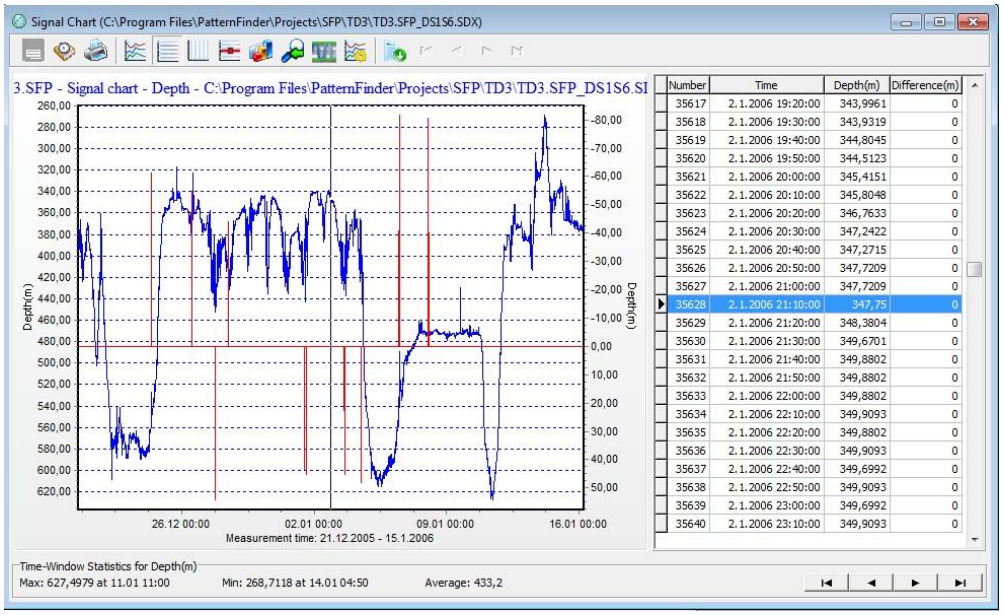

Figure 14 Single Spike Filter

The difference signal shows the spikes removed from the original SDX signal.

Set sampling rate

Click the **Filter Signal** button and select **Set sampling rate**. The following window appears:

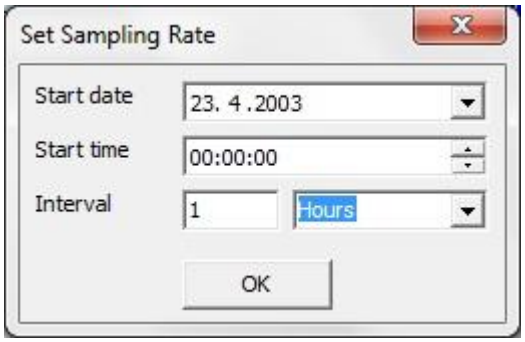

Figure 15 Set sampling rate

Set new start date, start time and sampling interval.

Click **OK** and the following chart appears:

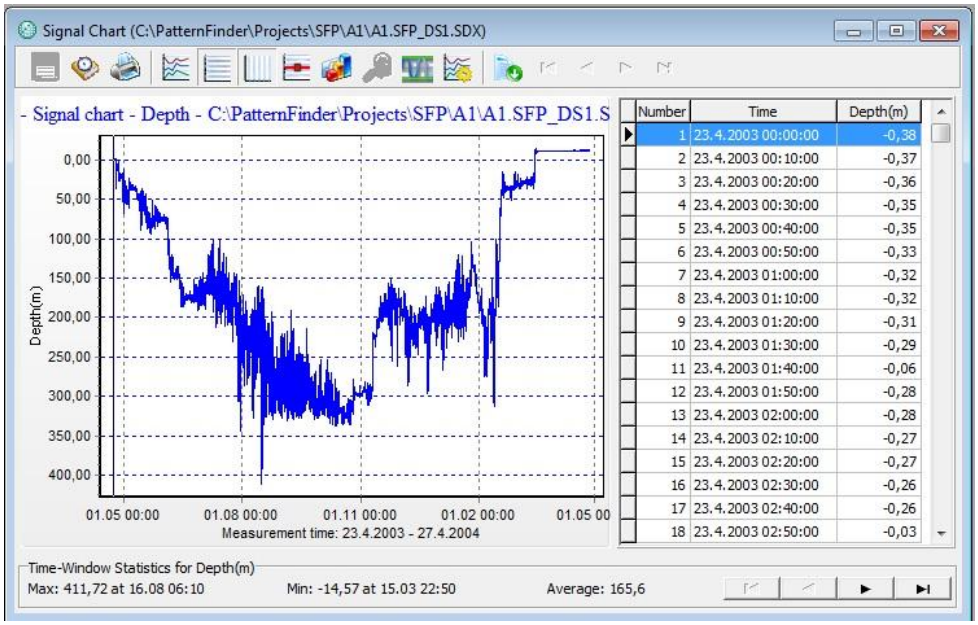

Figure 16 Set sampling rate

If the start time is outside the signal the starting value will be zero. Points are added until the signal ends and each point is interpolated.

History

Click the **History** button  on the chart bar to add comments and view information on the origin of the signal and the progress of the project (see figure 17). Click **Print** to print out the information (see figure 18).

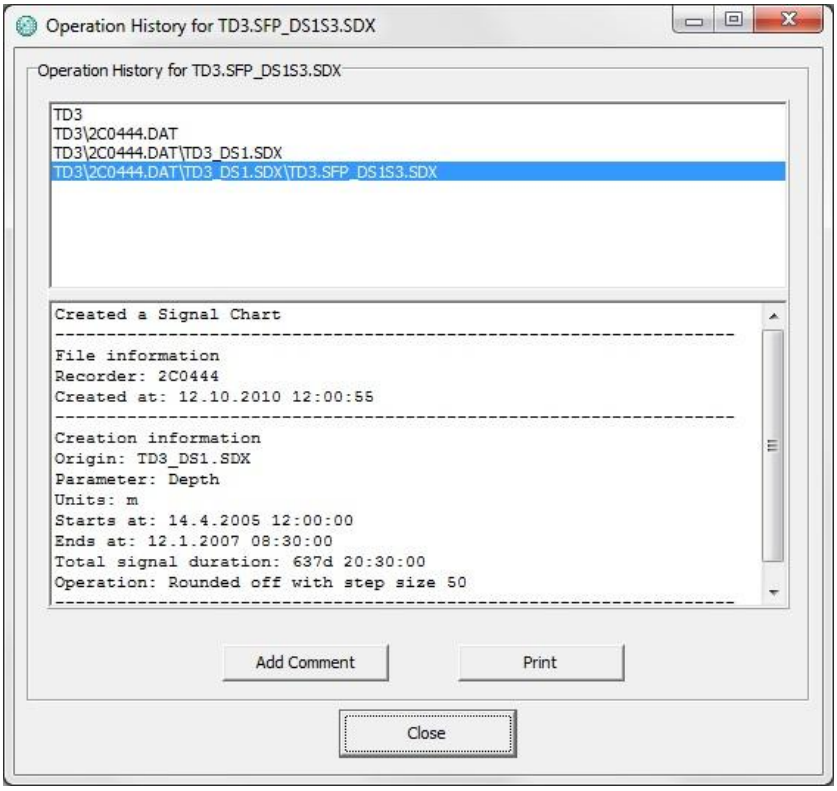

Figure 17 History

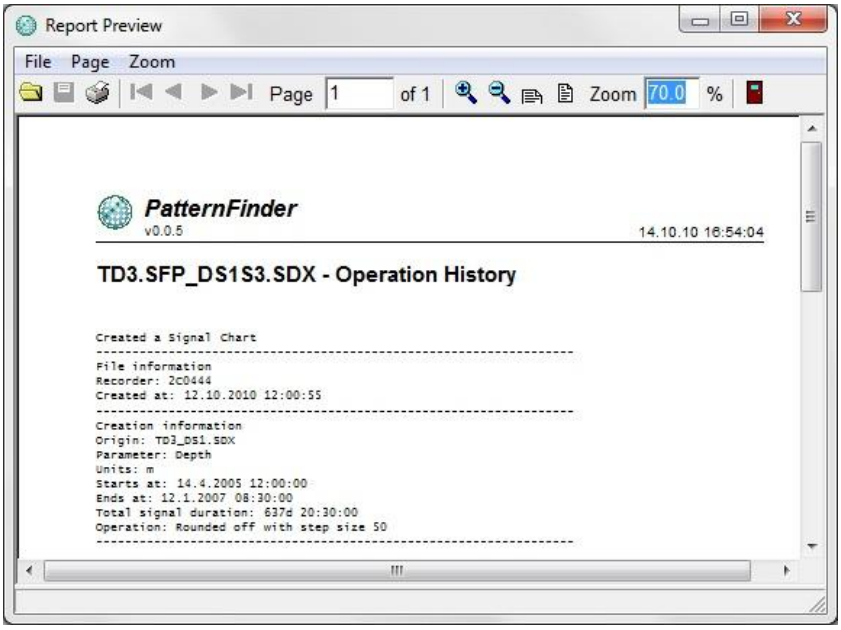

Figure 18 Print Preview