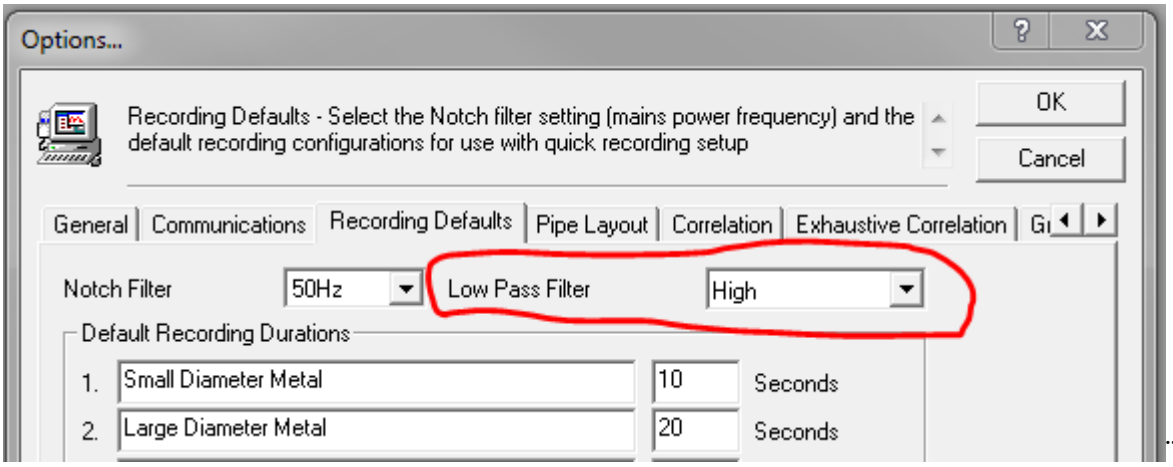
Ref: FAQ0085	Version: 1.0
Title – SoundSens i FAQ's	
Made By: AB 18/10/14	(Issue 1)

Soundsens i – explanation of advanced configuration options

Options> Recording Defaults > Low Pass Filter setting

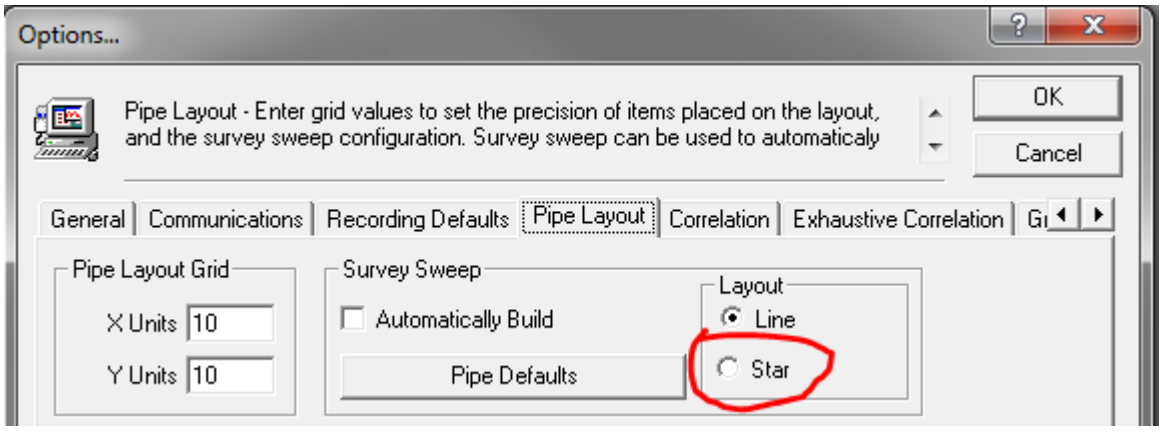
This is a way of focusing attention on the most prevalent frequencies for the given pipe properties. Plastic pipes would use a low / very low setting and steel pipes a medium or higher setting.



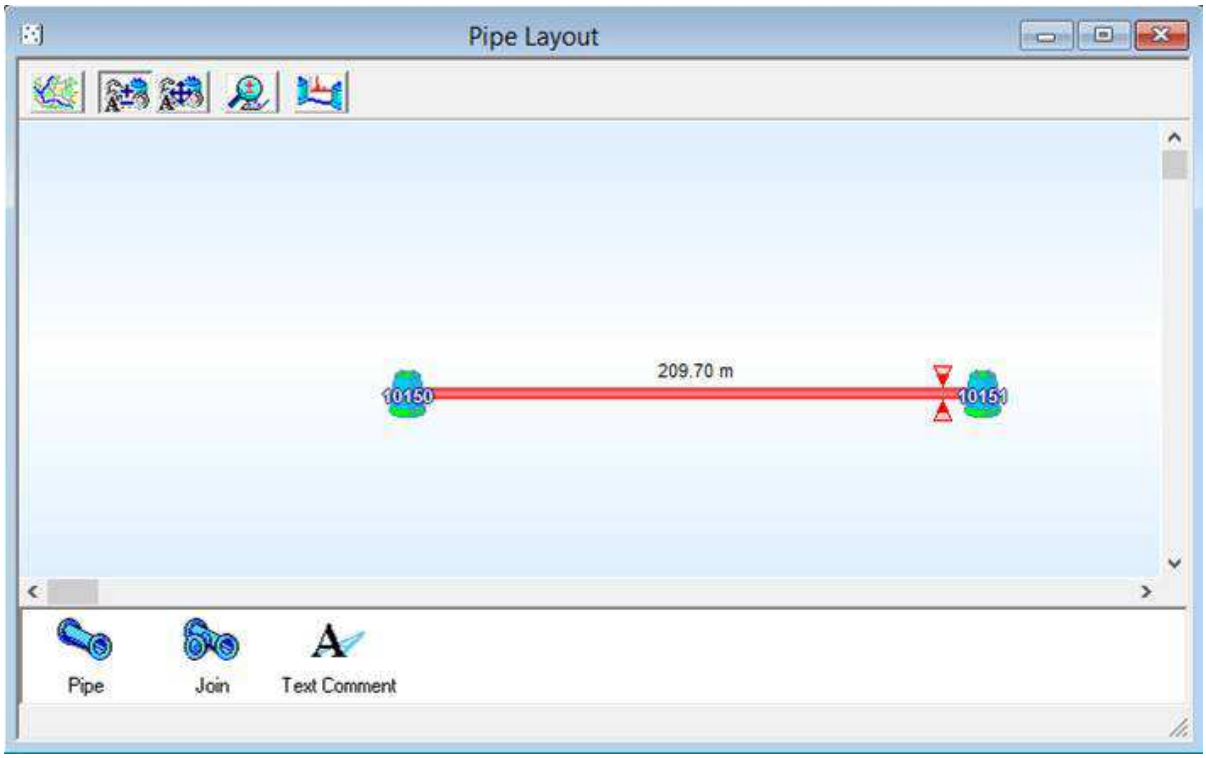
The default setting is 'High' so you should leave it at this in general use. The software works on the pipe layout and pipe properties that you configure in. You would really only change these low pass filter settings if you knew the pipe properties were giving you particular problems. In 99% of applications the default settings work fine – particularly if you are using the kit at night when ambient noise and flow noise are at their lowest in the pipes. SoundSens is best used by installing it one day configured to test at 2.00am the following night with a return in the morning to recover the pods, download and analyse. However it is not always practical to carry out testing at night and during the day you may need to be doing some 'fancy footwork' with filters to maximise the leak noise (peaks) and minimise other noises – it is really a case of 'trial and error' based on experience gained over many tests.

The critical thing for leak detection using acoustic devices is to understand how the leak noise is heard and what it sounds like – during training we encourage customers to set up known 'leaks,' carry out testing and then listen to the noise so they thoroughly understand the difference between the leak noise and the other noises that can be around. Also the acoustic files are stored so when they have success in the field again they can build experience by noting the conditions, settings and acoustic results.

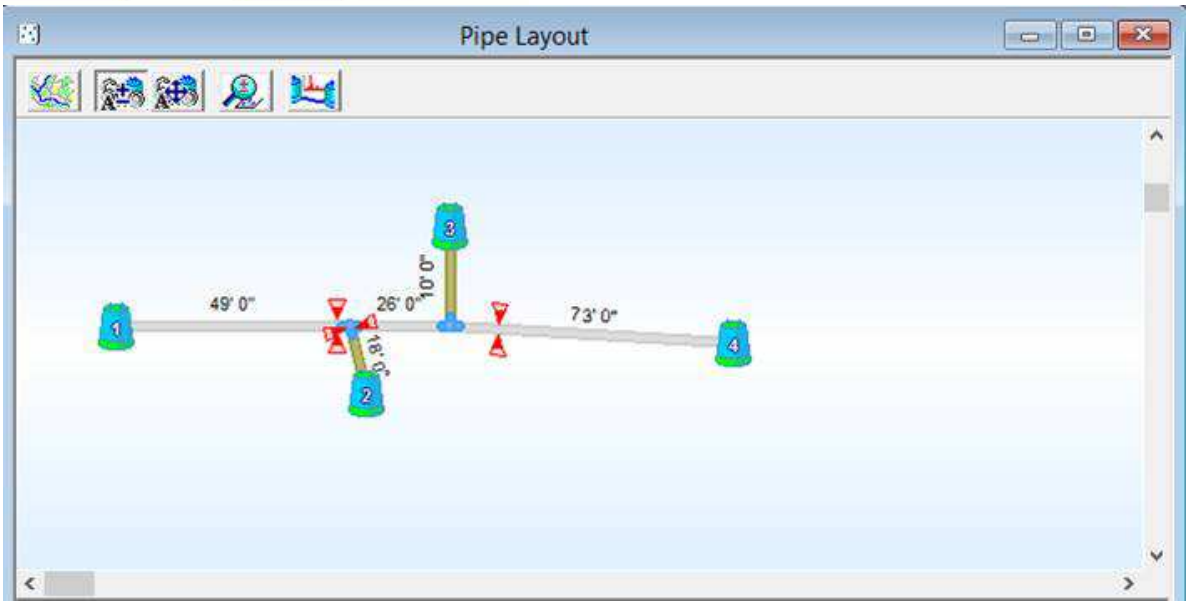
Options>Pipe Layout >Star or Line



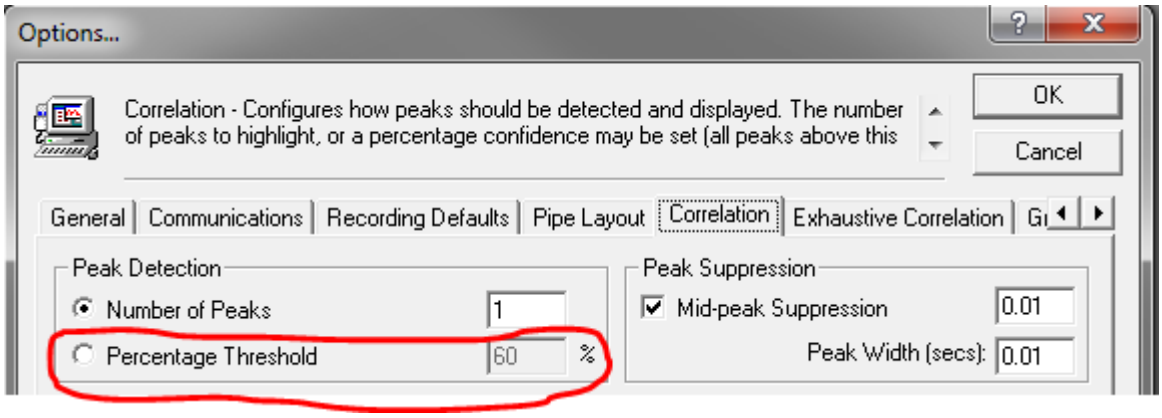
If the correlation is using two loggers with a straight piece of pipe between them then you would use the 'Line' setting –



– if the pipe layout involves several pipes meeting at the same joint then you would use the 'Star' setting -



Options >Correlation> Peak Detection



Correlation - Configures how peaks should be detected and displayed. The number of peaks to highlight (1 is set above), or a percentage confidence may be set (60% is set above) all peaks above this level will get highlighted on graphs. Select colours and values for leak markers. The percentage value range is the range of confidence levels where a peak is marked as a leak. The out of bounds value defines the pipe length close to loggers where a highlighted leak may be suspect (leak is too close to the logger to be certain a leak really exists as it may be caused by a noise source outside the pipe being correlated). Background colours may also be selected for leak markers. This is used to indicate the confidence of a leak on the pipe layout. The more foreground and less background colour, the higher the confidence. Leak optimisation may be enabled. This treats leaks that occur within the specified distance as the same leak, and the prominent leak is marked on the pipe layout and the others are greyed. This also checks leaks exist in multiple recordings. If the leak is Not found in a majority of recordings, the leak marker is displayed shaded, background colour and white (instead of marker colour and background colour). The default graph type may be selected. This is the default type that will be displayed in correlation windows.

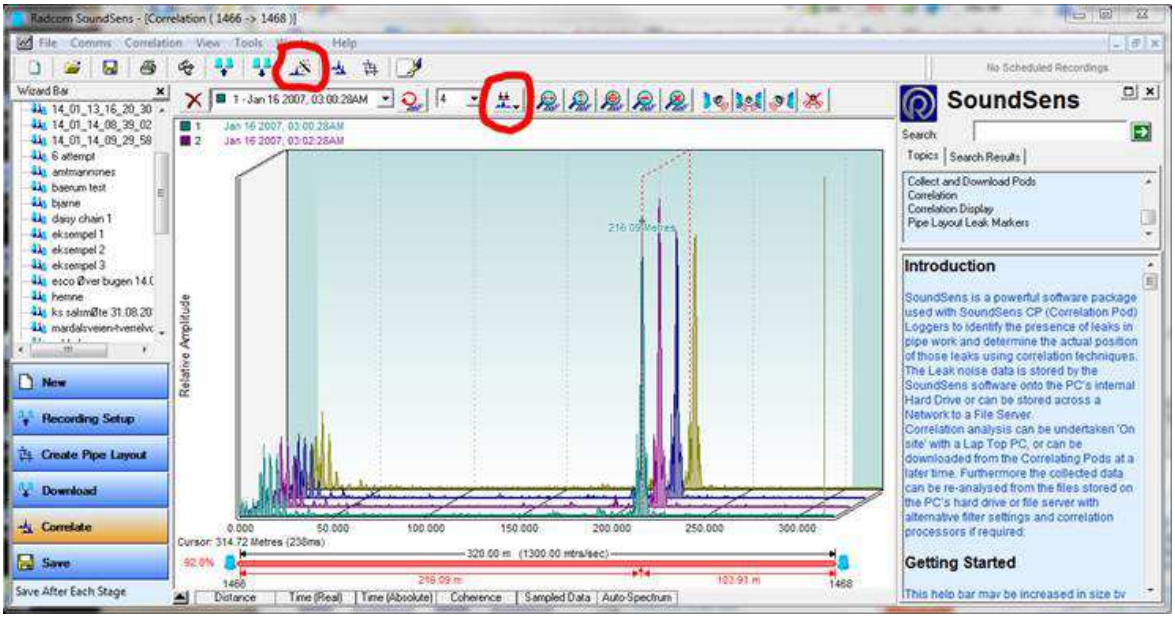
Measuring the speed of sound in an unknown pipe

You would use this when you are not confident that you know enough about the pipes underground, so you would physically measure the speed of sound in the pipes and then apply this figure to the correlation – it is then independent of the pipe properties.

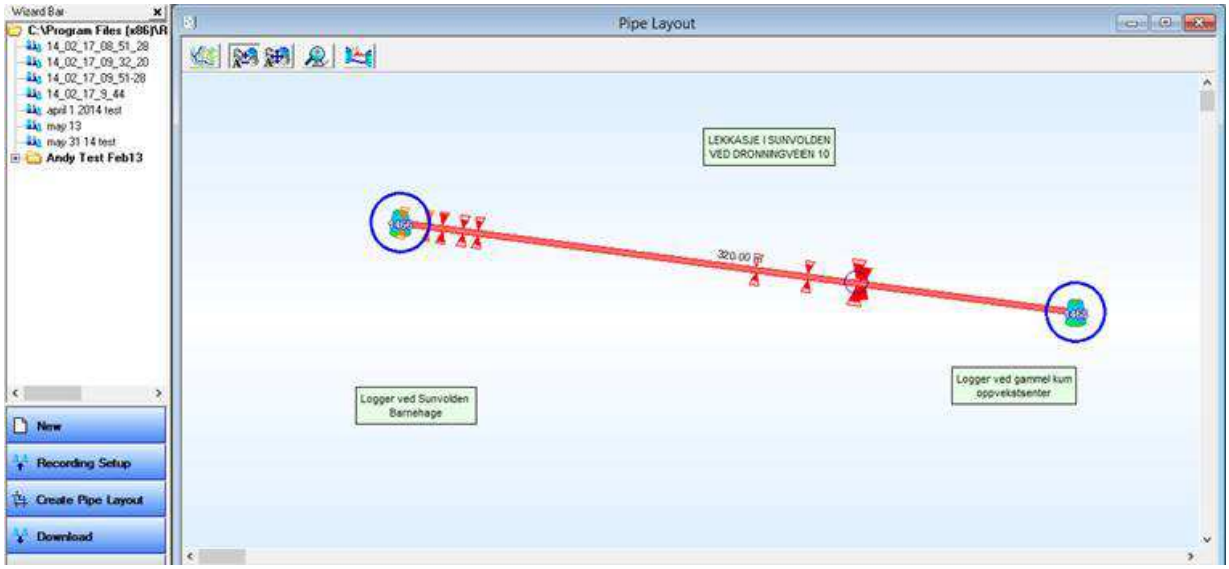
Operating Peak Suppression and calculating actual sound velocity

How to use Peak Suppression and Velocity in the SoundSens software?

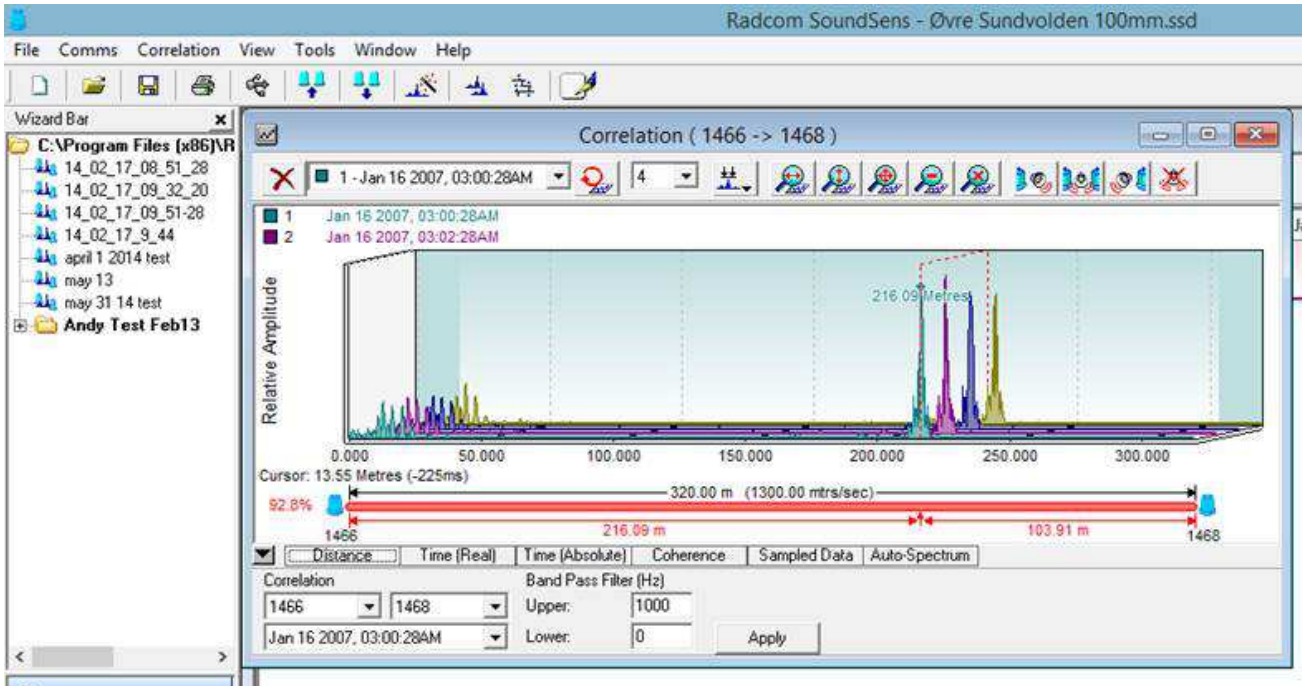
Below is a simple correlation between two loggers with the leak was located correct.



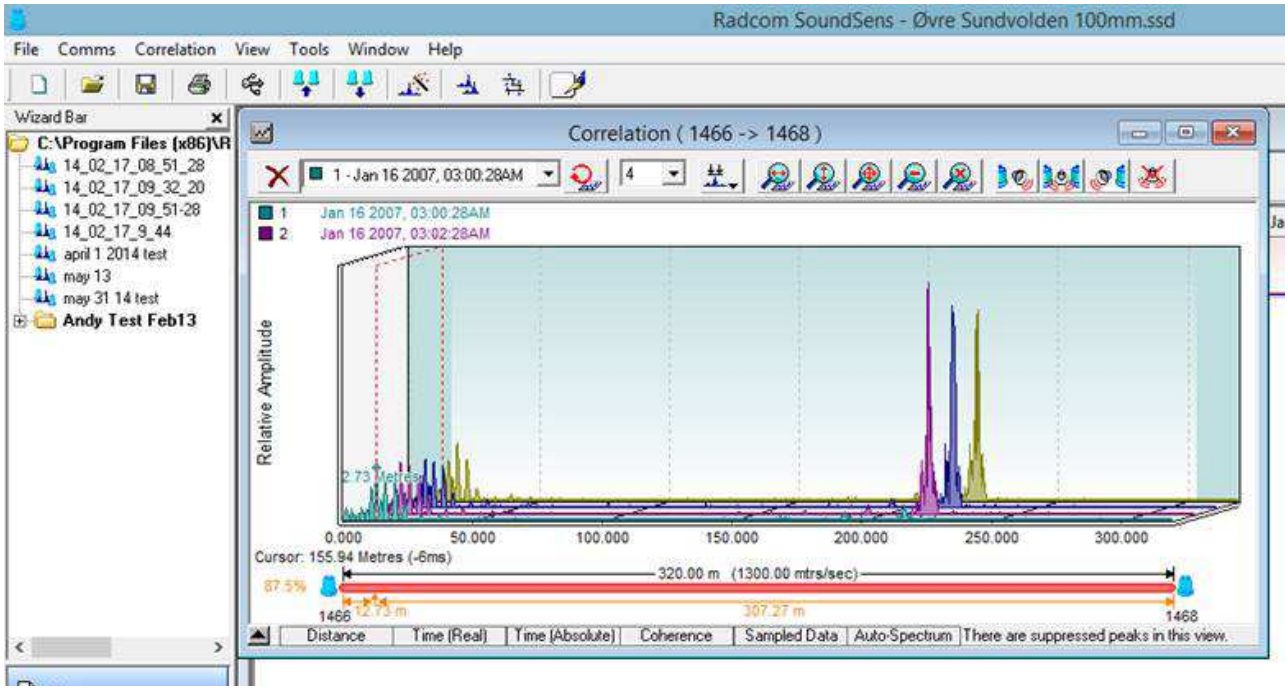
This is not going to work very well with this example because it so obviously identifies the leak position with a single high and narrow peak - there is little possibility of it not being a leak and there are no other significant peaks in the vicinity (the next significant peak is near to 1466)



Note - the leak position in the below view is identified at 216.09 metres from the logger 1466. (103.9m from logger 1468)

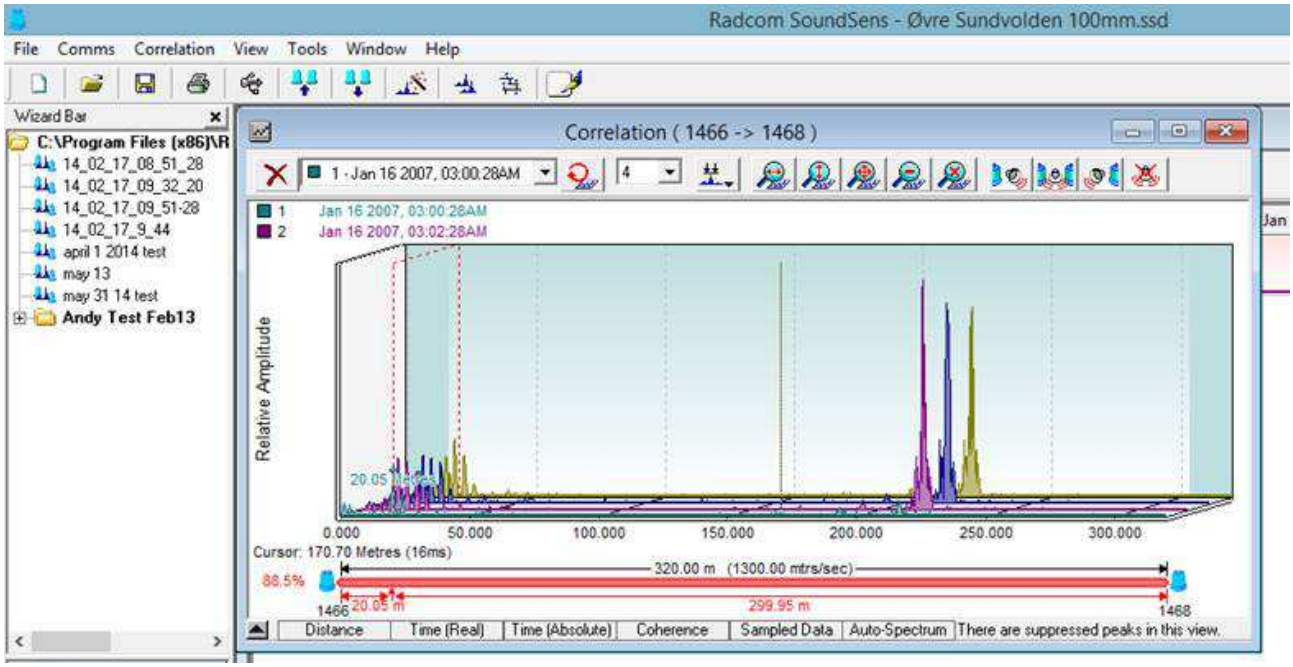


If you now use the Peak Suppression icon and select 'Suppress next' you will see this below (as the name suggests pressing this button suppresses the main peak)



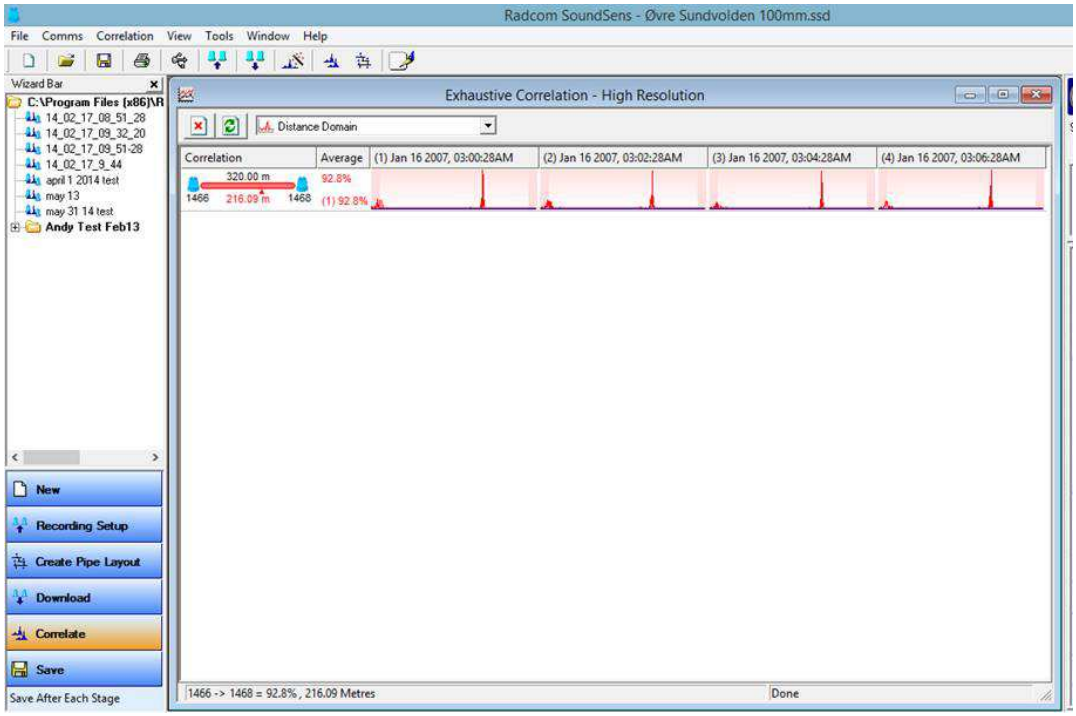
Note the biggest peak has now been eliminated from the correlation and the second most prominent peak has been identified – this is at 12.73metres from logger 1466.

If I now again select 'Suppress next' you will see this –

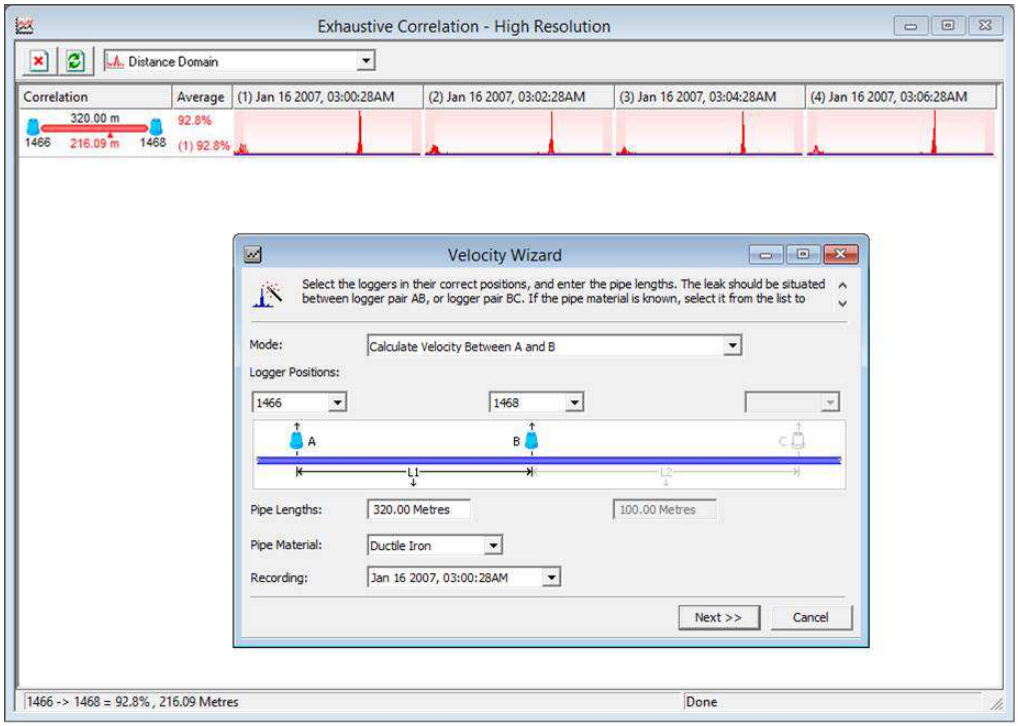


The second highest peak has been eliminated from the correlation and the third one now identified at 20.05 metres from logger 1466. If you continue to select 'Suppress Next' the software will continue to remove the next most prominent peak. If you have a number of significant peaks then a combination of peak suppression and audio will help you to identify how many of them truly are leaks.

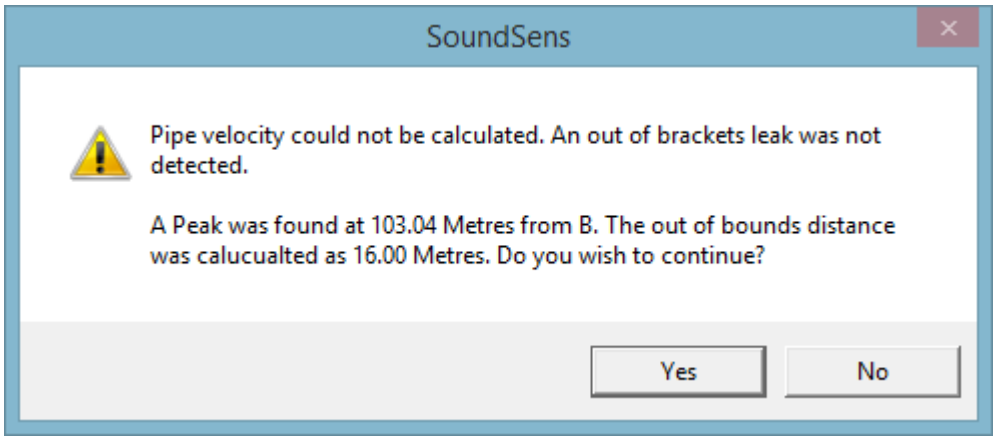
From the correlation screen below –



If you now select the Velocity wizard button you will see this –

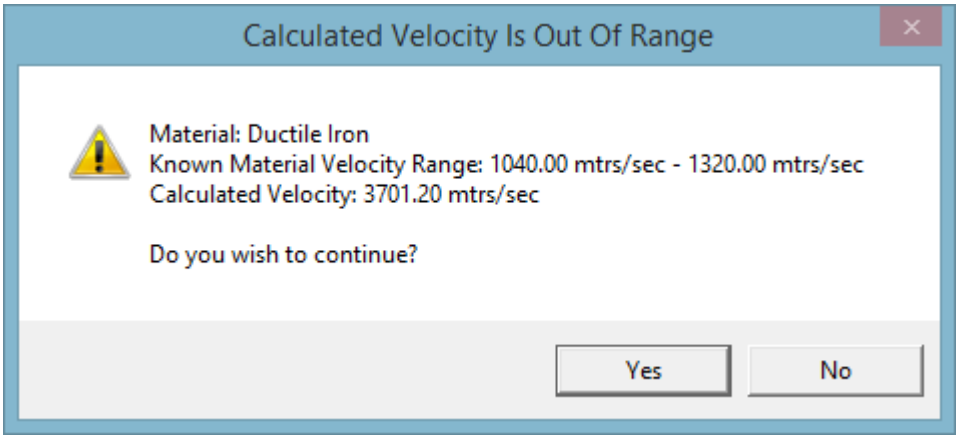


Select Next -

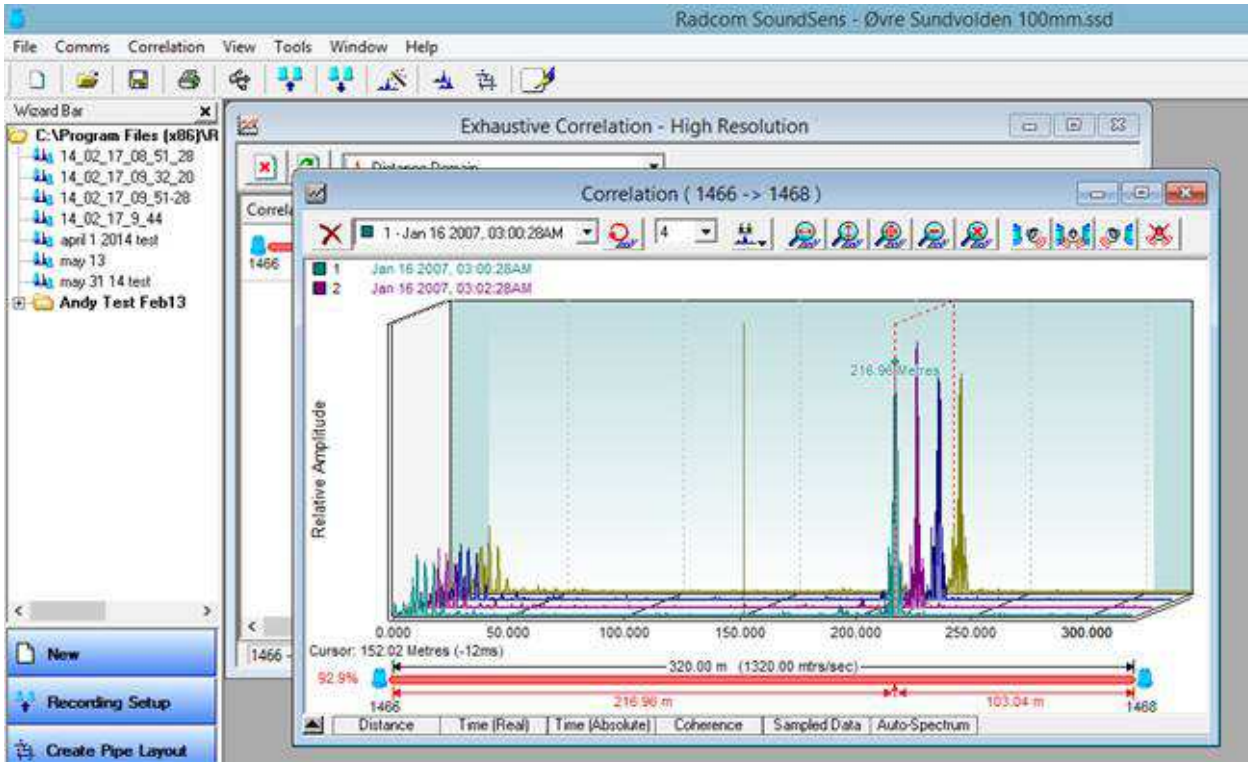


The error message advises it cannot calculate the pipe velocity – ideally you need at least 3 loggers or a significant leak outside of the two loggers (out of bracket) – sometimes you can cause this using a local tap to simulate the leak.

If you select 'Yes' anyway -



It calculates the velocity based on the 'assumptions' the software has had to make – if you then select 'Yes' it will apply the new velocity to the correlation as below – and as you can see in this case it does not adjust it by much (because the leak is so prevalent).



Document History:

Edition	Date of Issue	Modification	Notes
1st	18/10/14	Release	