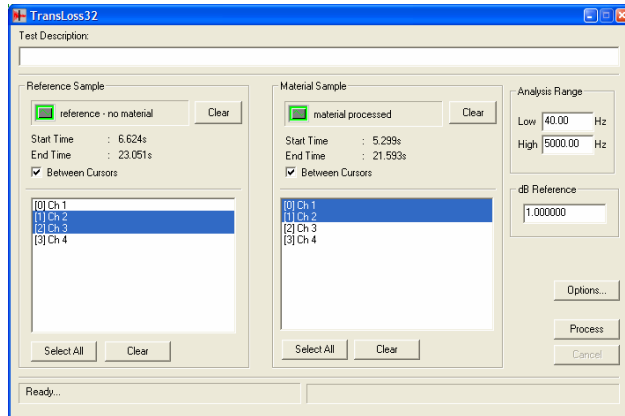# TransLoss32 Documentation V1.0
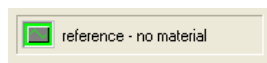
TransLoss32

TranLoss is a single panel application that is used to determine the transmission loss produced by certain noise absorption material in a test chamber. The module will accept either time domain signal objects or third-octave matrix objects.

SOURCE DATA OPTIONS

Signal or Matrix Object

 The module will accept either two signal or two matrix objects but not a mixed combination. The first object dropped onto the module will be selected as the "Reference Sample". The second object will be the "Material Sample".
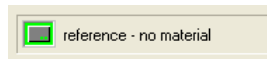
 If you attempt to drop a matrix object onto the module when a signal has already been selected the following message will be displayed.
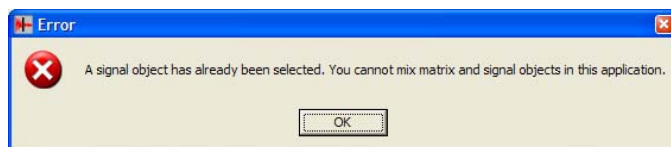
The signal objects can have different sample rates. However the generated third-octave data will only be over a frequency range that is supported by both data objects. This also applies to the signal duration, the actual integration time will be the shortest selected range between the two objects.

The matrix objects must contain third-octave data and a time dictionary. Third-octave data is identified by the presence of both a "Freq" and "ISO" dictionaries.

Channel Cursor Duration (SIGNAL OBJECTS ONLY)
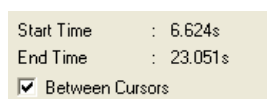
 If the "Between Cursors" checkbox is checked then the Start and End times will reflect the time interval set between the dotted and solid cursors for the selected signal object. This will represent the interval over which the signal will be processed. The duration can be changed by using the "Trace" module.

If the "Between Cursors" is unchecked then the full signal channel duration will be used irrespective of cursor position.

When two objects have a range selected the shortest interval will be used as the averaging period.

Reference Sample Object : start = 10s, End =30s, Duration = 20s
Material Sample Object   : start = 12s, End=42s, Duration = 30s

The averaging period will therefore be 20s.

NOTE: THESE OPTIONS WILL NOT BE VISIBLE FOR MATRIX DATA. THE TRANSLOSS MODULE WILL PROCESS ALL TIME SLICES IN THE MATRIX OBJECT
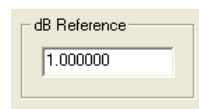
Channel Selection
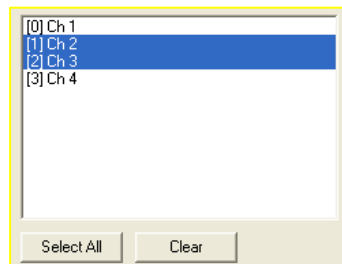
When a signal or matrix object is selected the list of channels will be displayed in the list box. This user may select which channels will be averaged together in the final result.

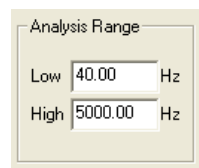Click on the "Select All" button to quickly pick all channels.

"Clear" will remove the selections.

dB Reference (SIGNAL OBJECTS ONLY)

The "dB Reference" group allows the user to set a scaling factor for the third-octave data when it is converted to dB values. If the time trace is in Pascals then the dB Reference should be set to 20µPa.

Analysis Bandwidth

For both signal and matrix inputs it is possible to select the frequency range over which the output results will be measured. The actual output frequency range will be dependent upon the limits of the source data. If the matrix range is 10kHz and the upper Analysis limit is set to 20KHz then a 10KHz limit will be used. If a signal object is sampled at 10KHz and the lower Analysis limit is set to 40Hz then 40Hz will be lowest limit of the analysis.

PROCESSING OPTIONS

Click on the "Options…" button to show the following dialog.
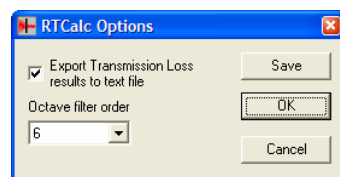
"Octave Filter Order" allows the user to control the number of pole/zeros used in the time-domain third-octave filter bank. Filter order 6 will produce filters that are equivalent to the ISO standard. Lower orders will produce filters with a wider passband, but that are able to process data quicker.

"Export Transmission Loss Results to text file". When checked, this option will write a summary of the results to a text file. The file will have the same name as the resultant matrix object and it will be written to the folder setup for the "Save Place".

PROCESSING DATA

When channels have been selected for both the "Reference" and "Material" data objects the "Process" button will be enabled. When the "Processed" button is pressed the user must specify the name of the target object.
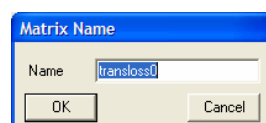
Assuming no errors are detected in the settings selected, then the data will be processed and a new matrix object will be produced.

The object will contain a series of channels containing third-octave data. The following channels will be generated:

Matrix Name	Description
Reference Channel 1	Third Octave of the first selected Reference channel. Includes Lin and Awt data.
Reference Channel 2	Third Octave of the second selected Reference channel. Includes Lin and Awt data.
Reference Channel N	Third Octave of the Nth selected Reference channel. Includes Lin and Awt data.
Material Channel 1	Third Octave of the first selected Material channel. Includes Lin and Awt data.
Material Channel 2	Third Octave of the second selected Material channel. Includes Lin and Awt data.
Material Channel N	Third Octave of the Nth selected Material channel. Includes Lin and Awt data.
Average Reference	Average third-octave spectra of all reference data channels
Average Material	Average third-octave spectra of all material data channels
TransLoss	The dB difference between the "Average Reference" and "Average Material" channel. The Lin and Awt dictionaries also contain difference values.

## EXAMPLE PROCESSING RUN WITH SIGNAL DATA

Assume we have two signal objects:
1. "Reference – no material" contains uniform white noise. We assume that this data is recorded in a sound chamber on 4 microphones with no sound absorption in place.
2. ""Material Processed" contains uniform white noise. We assume that this data is recorded in a sound chamber with absorption material in place. For the purpose of this test the data has been attenuated by 6db and this attenuation is independent of frequency.
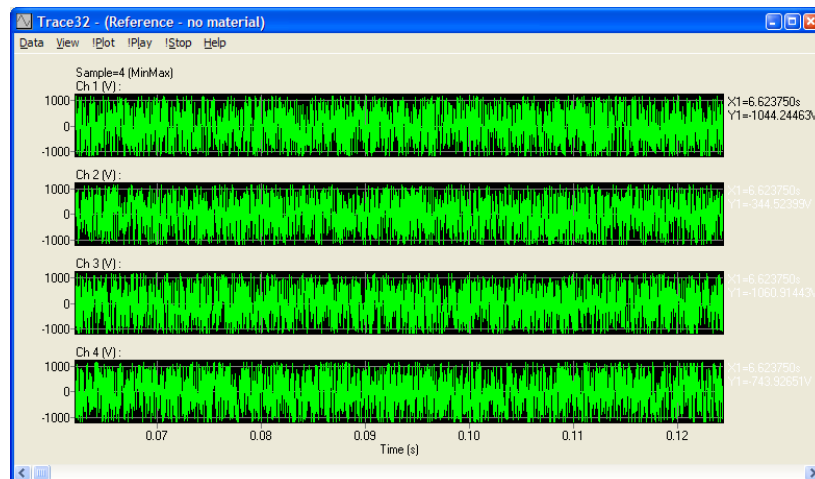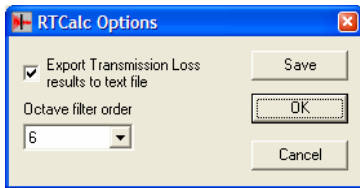

Drop the two objects into the TransLoss module.
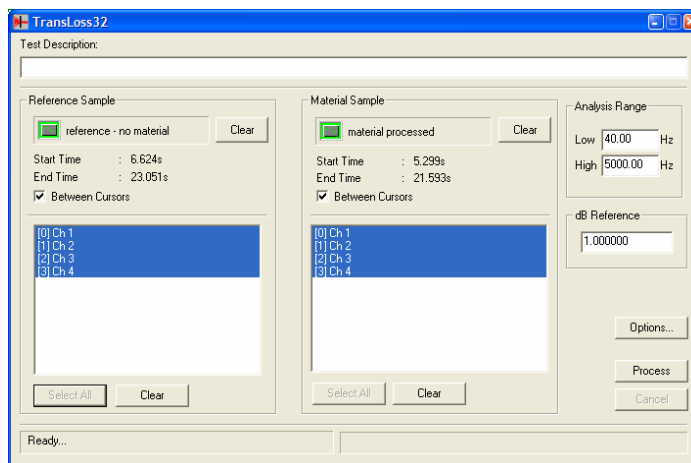
1. For each object click on the "Select All" button.

2. Set the dB reference to 1.0.

3. Set the Analysis Range (40, 5000).

4.   Click on the Options button and ensure the settings are as follows:

5.   Click on OK to close the Options Dialog

6.   Enter a test description

7.   Click on "Process" to start the analysis

8.   Enter a name for the target matrix object and click on OK

9.   The data will be processed and a new matrix object will be produced. This object will be best viewed using the OGraph module. This light green trace is the transmission loss result and this shows a 6dB loss between the reference and material treated measurements.
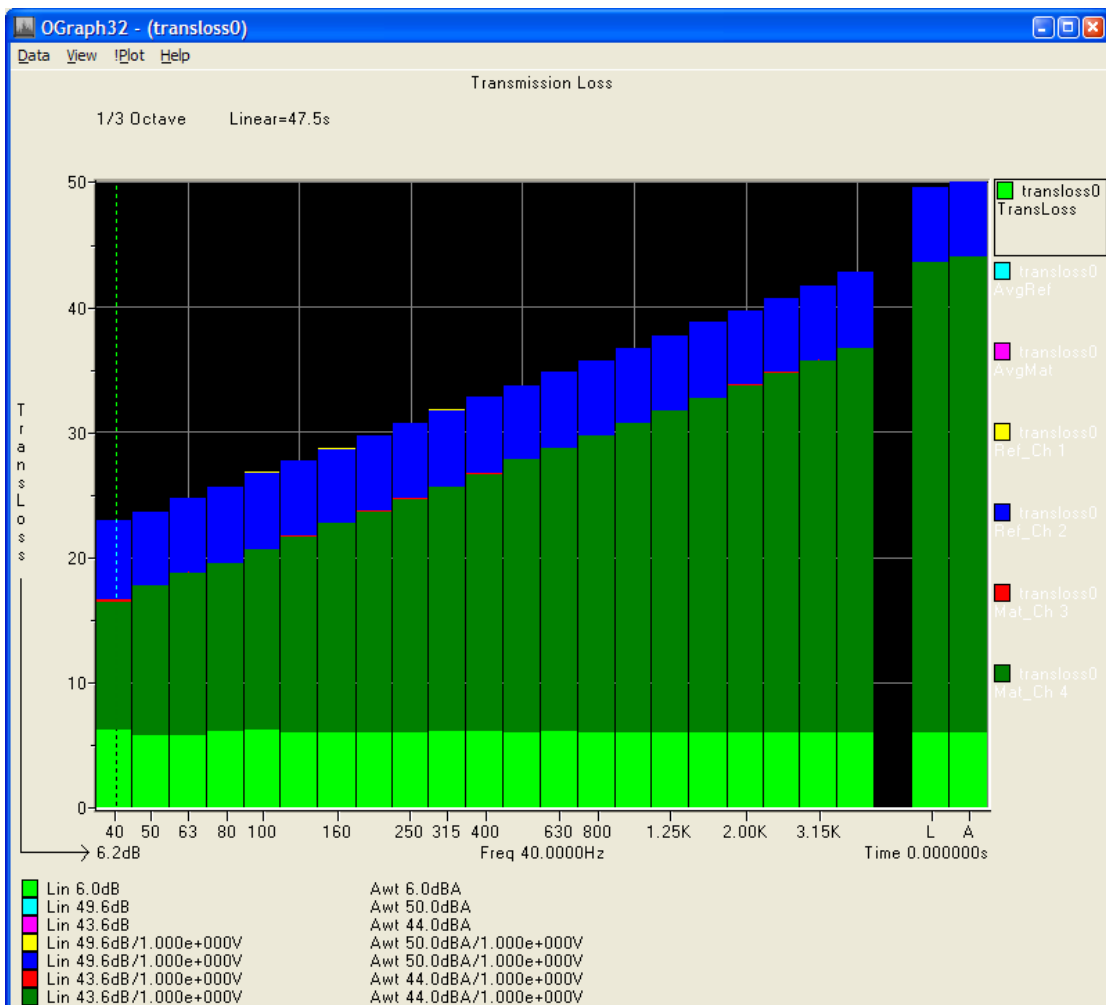

```
Transmission Loss matrix

Test Name        : transloss10
Test Description : Test Desc

Reference signal object :              Reference - no material.~si
```

Material Processed signal object :   material processed.~si
Target matrix object :   transloss10.~ma
Created :   Wednesday, 15 December 2004 at 23:15:17

Filter	Reference	Processed	Trans Loss
40.00	23.49	17.57	5.91
50.00	24.56	18.52	6.04
63.00	25.52	19.67	5.86
80.00	26.83	20.92	5.91
100.00	27.60	21.65	5.95
125.00	28.63	22.64	5.98
160.00	29.64	23.48	6.16
200.00	30.62	24.54	6.08
250.00	31.71	25.68	6.02
315.00	32.82	26.79	6.03
400.00	33.74	27.72	6.02
500.00	34.86	28.80	6.06
630.00	35.74	29.72	6.02
800.00	36.72	30.70	6.02
1000.00	37.70	31.66	6.03
1250.00	38.72	32.69	6.03
1600.00	39.73	33.73	6.00
2000.00	40.75	34.74	6.01
2500.00	41.69	35.67	6.02
3150.00	42.77	36.77	6.00
4000.00	43.75	37.72	6.03
5000.00	44.77	38.74	6.03
Lin	51.58	45.56	6.02
Awt	52.03	46.01	6.02