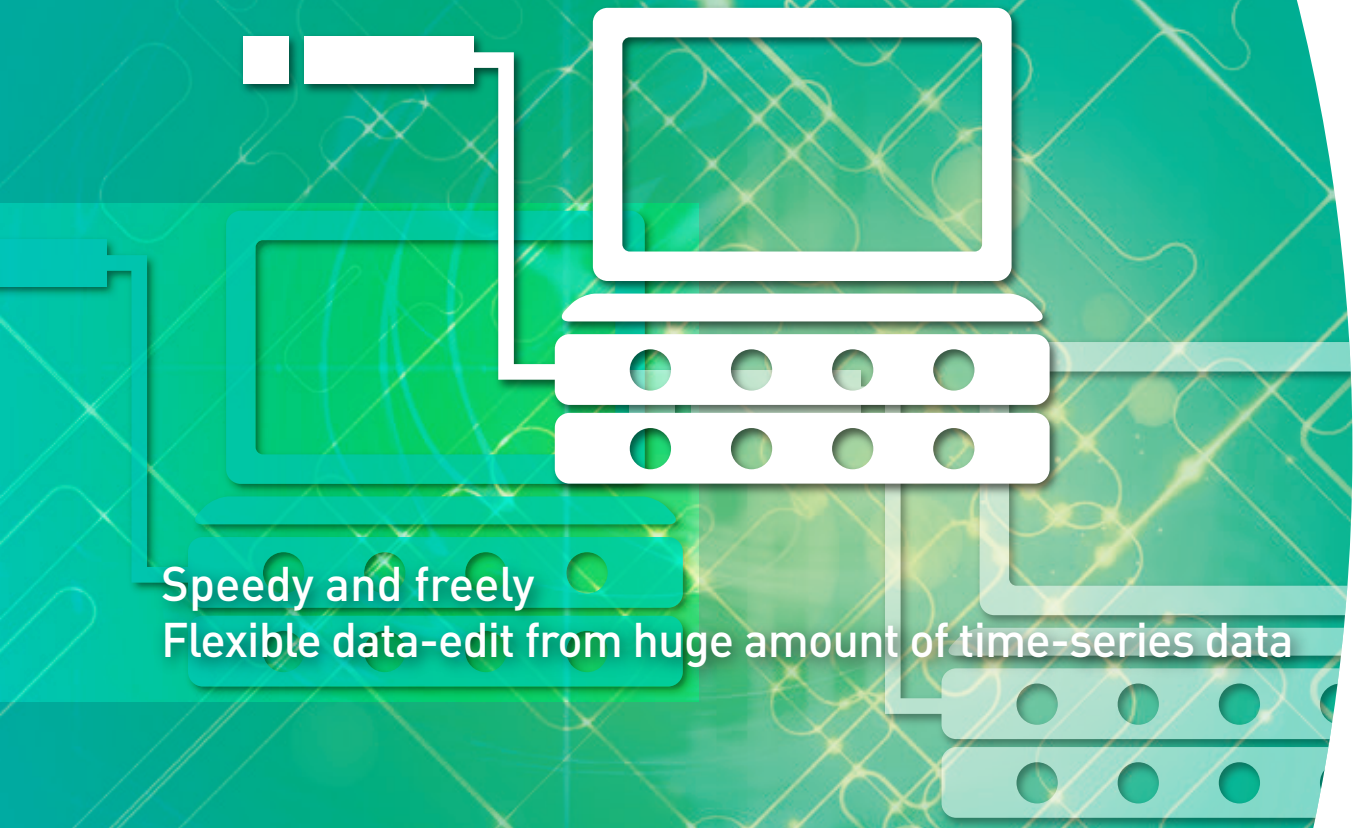
Time-series Data Analysis Software

OS-2000 series



Speedy and freely
Flexible data-edit from huge amount of time-series data

ONO SOKKI

OS-2000 series

Flexible data-edit from huge amount of time-series data. Largely shorten an effort and the time for analysis.

The OS-2000 series allows you to edit and analyze long time-series data freely that is not able to be handled by Microsoft® Excel®.
This software can handle data formats of recorder made by other company as well as general-purpose formats including CSV and WAVE.

Feature

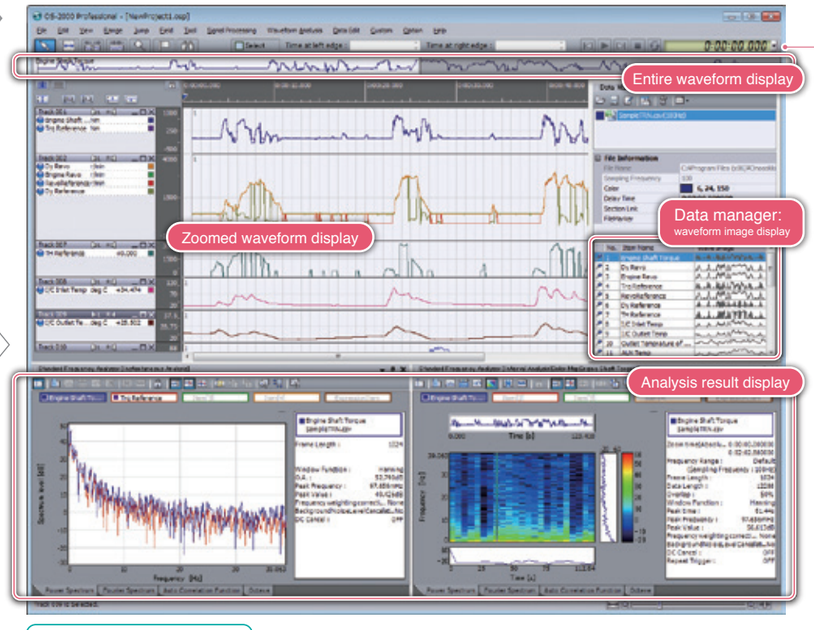
- ▶ Simultaneous display of different data formats, free graph layout such as side-by-side or overlapping display.
- ▶ Easily import large volume of time-series data, PC analysis available.
- ▶ Rapid processing does not disturb the operator's attention.
- ▶ Entire waveforms and zoomed waveforms are able to be simultaneously displayed. Diverse editing functions including search, time correction, clipping and more are provided.

Import

- ●ASCII file ●EXCEL file
- ●WAVE file ●MDF file
- ●MOVIE file ●UFF file

- ●DS/CF file ●MCU file
- ●DS-0328 file ●AU-4100A file
- ●ORF file ●VARTS-Ⅱ file
- ●FAMS file ●WS-5160 file
- ●KY-1000 file

- ●TEAC Corporation
  TAFFmat file
  AQ-VU file
- ●HIOKI E.E. Corporation
  MEMORY HiCORDER file
- ●Meidensha Corporation
  MEIDACS file
- ●Yokogawa Electric Corporation
  WVF/WDF file
- ●IPG Automotive K. K.
  ERG file
- ●GRAPHTEC corporation
  GBD file

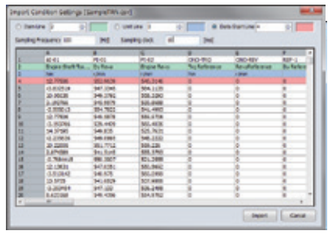


* For data import file, refer to P16.

Operation procedure

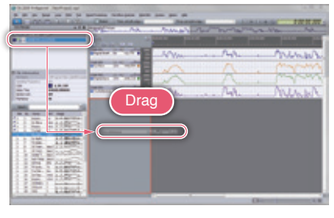
Step 1 Import the data file

The OS-2000 series can import CSV file as well as Ono Sokki's original format (ORF file) and WAVE file. Input the item line, data starting line and sampling frequency or sampling clock.



Step 2 Display the data

Data item of imported file is displayed on the screen of the OS-2000 by dragging it. Different format data is able to be displayed simultaneously on the same screen.



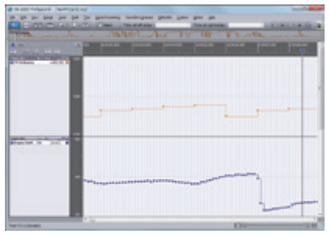
Step 3 Analyze the data

Drag the data item to the analysis screen to start analysis. Multiple analysis screens are able to be displayed simultaneously, and it enables comparison of the data before and after analysis.

Display function

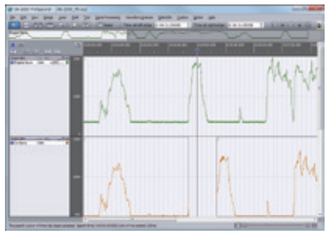
Displaying waveforms of different sampling frequencies

Waveforms of different sampling data are able to be displayed simultaneously.
*The lower waveform in the following screen has a sampling frequency which is ten times higher than that of the upper waveform.



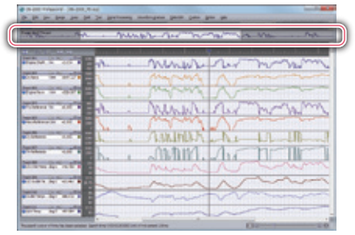
Freely dividing and moving waveform

You can divide waveform at any point and then move it to the location that you chose.



Zooming in and out of waveform freely

The Navigation view allows checking of entire waveforms and enlarged areas at a glance. Enlarged areas can be easily scrolled with a mouse.



Playback function

Loop playback of the specified area

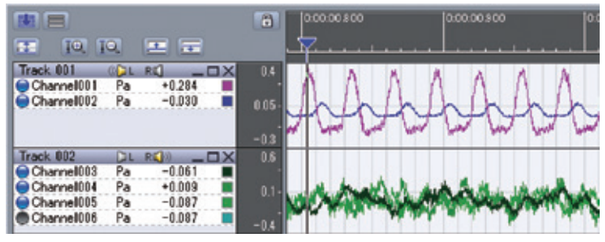
Data in a specified area is able to be replayed repeatedly with the loop ON/OFF button.

Switchover of playback channels

Playback channels are able to be changed without stopping the sound, being effective for identification of sounds having little difference. You can switch channels of each sound which has been recorded at multiple points with the same timings.

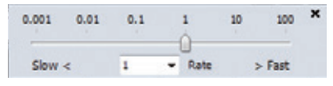
Mixing playback

This function enables mixing, compound, and playback of several data as one file. Recorded sound file of different phenomena, and sound file of frequency-resolved sound are able to be synthesized and replayed.



Change of playback speed

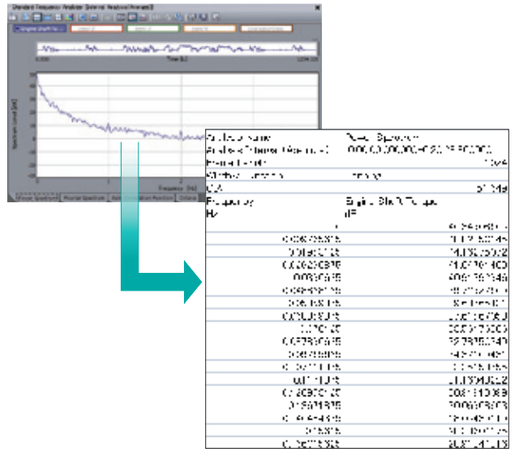
Multiple events occurring at short intervals sometimes appear as if a single sound at normal speed. By slowing down the playback speed, those events can be identified as separate events.



Output function

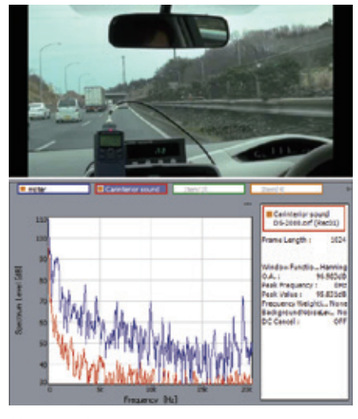
CSV output

The analyzed data is able to be stored in CSV file as a numerical value.



Video (AVI format) output function

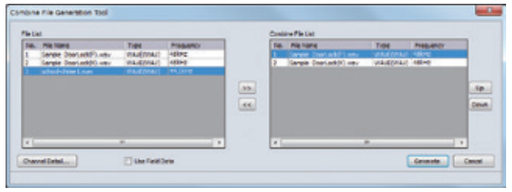
You can display and store time-lapse in each frame (minimum : 1 frame) as a video file by using the waveform analysis option.



In the OS-0281 Video Playback option, the video data and analysis results are able to be displayed together on the same screen (AVI output).

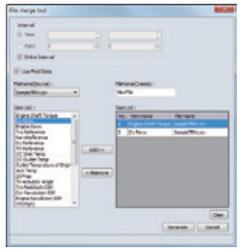
OS-2700 Professional (Functions of OS-2500 and OS-2600 included)

Combine file generation tool



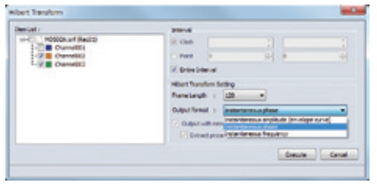
Combines any two files to create a new file.

File merge tool



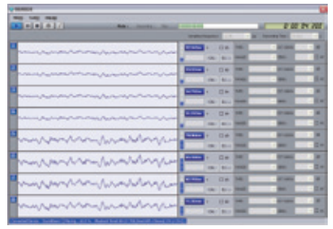
This tool merges necessary items from multiple imported files into a single new file.

Hilbert transform function



Calculates instantaneous amplitude (envelope), instantaneous phase, and instantaneous frequency.

Recording function

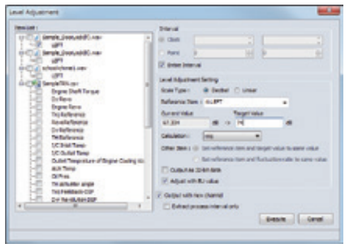


Records data from the DS-2000/3000 series or audio devices. The recorded data is imported as a new file.

Other function
- Waveform generation
- Playback function (Absolute sound pressure)
- Taper processing
- Control API

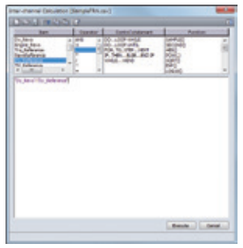
OS-2600 Standard (Functions of OS-2500 included)

Level adjustment



The level of imported data is able to be adjusted.

Inter-channel calculation



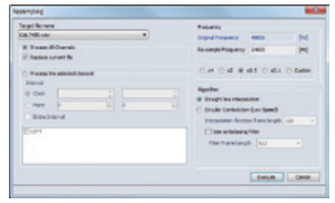
Allows calculation between multiple channels using operators.

- **9 operators:** Four arithmetic operations, etc.
- **5 control statements:** DO..LOOP, etc.
- **19 functions:** ABS, EXP, etc.

F/V converter

Converts rotation pulse, DC voltage data to rotation data. You can select the pulse data interpolation from linear, spline, and Hermite.

Resampling

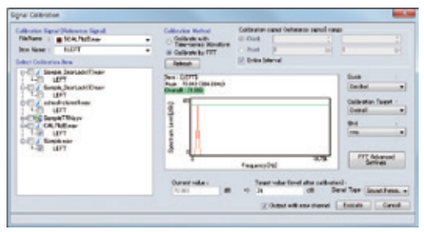


Changes frequency of the original sampling and creates the data for the changed sampling frequency.

Other function
- Search value extraction
- Time axis calculus

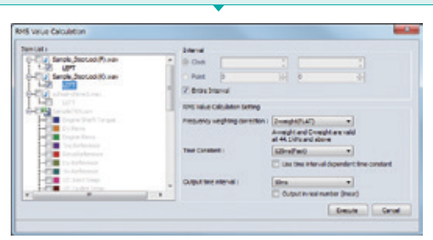
OS-2500 Basic

Signal calibration



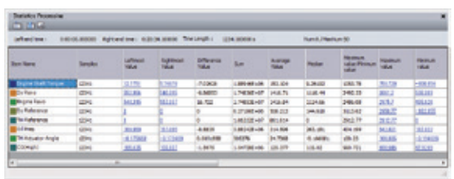
Allows calibration based on reference signals.
Example: Sound pressure calibration of data using a sound calibrator.

RMS value calculation



You can see the time difference of the sound pressure level same as the sound level meter.

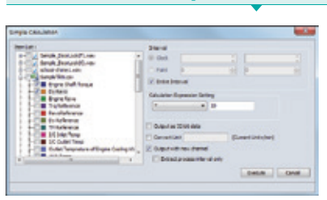
Statistical processing (interval)



This command performs statistical processing of the specified channel and specified range. The resulting statistics are displayed as shown above. It can be used for multiple channels.

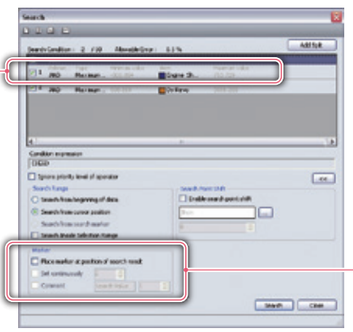
Statistical processing item:
Difference value, Sum, Average value, Median value, Maximum-Minimum value, Maximum value, Minimum value, Standard deviation, RMS value, Local maximum value-Local minimum value, Local maximum value, Local minimum value, Skewness, Kurtosis, Form factor, Peak factor, Average absolute value, Area, Area+, Area-

Simple calculation



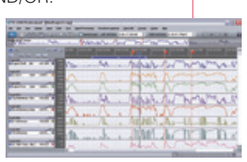
This function executes 6 functions including arithmetic operations with constants, ABS and LOG, for the specified channel data. Can be used for tasks such as changing the data unit or removing extraneous offset values.

Search function



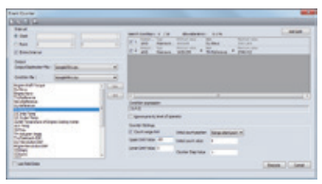
You can perform search with up to 10 conditions by using AND/OR.

Search function:
Allows easy search with the level, edge and amount of variation.



Marker function:
Marker and label are placed automatically on the search result. You can edit waveform with smooth operation.

Event counter



This function creates count waveform of level, edge, and change amount. It largely extends the coverage applied such as conversion from rotation signal to angle waveform etc.

Meter

Rotation speed, vehicle speed and other data are able to be displayed on analog meters.

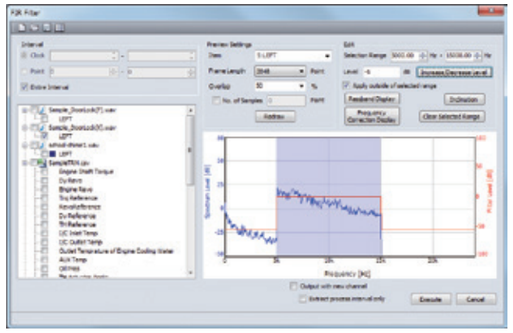
* A red zone (warning area) and peak hold function are provided. You can output a movie file that includes each analysis result and the video together.

Other function
- Changing of channel setting
- Signal type settings
- Moving average
- Synchronizer (function for aligning the positions of time waveforms using trigger signals)

FIR filter OS-0253

Included in OS-2710, OS-2720, OS-2740, OS-2760 and OS-2770

FIR filter processing:
Filtering for increased/decreased levels, taper or acoustic characteristics can be performed on specified channels and ranges.



IIR filter OS-0261

Included in OS-2740 and OS-2760

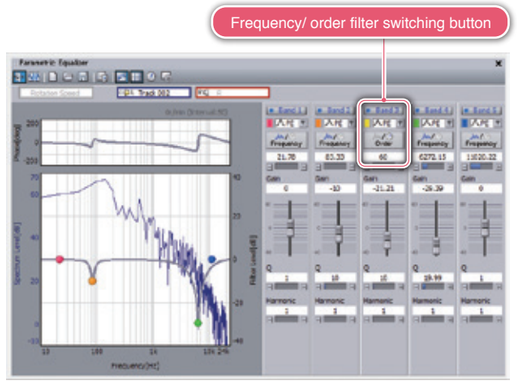
By listening to a sound whose characteristic quantities (frequency and order components) have been increased or decreased after being extracted through various analyses, the validity of analysis results is able to be confirmed. Filter design is specified by frequency and order. It is also possible to listen to sounds which have been processed with a mixture later.

Parametric Equalizer

User can design up to 5 filters. This function allows you to listen to the sound after passing a filter while reproducing the recorded sound.

•Filter type:
HPF, LPF, BPF, BRF (band reject filter), PE (parametric equalizer: filter for increase/decrease of specified gain)

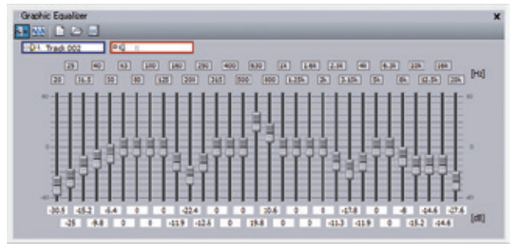
•Harmonic filter function:
Up to 10 orders of frequency components are able to be increased or decreased in conjunction with the standard frequency.



Parametric Equalizer

Graphic Equalizer

You can hear the sound in real time which level is increased or decreased for every 1/3 octave.

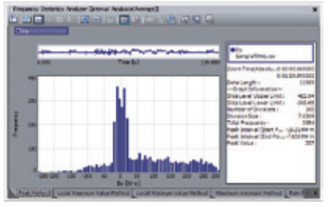


Graphic Equalizer

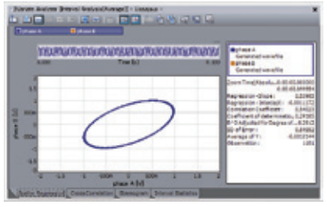
Statistical Analysis OS-0251

Included in OS-2710, OS-2740, OS-2760 and OS-2770

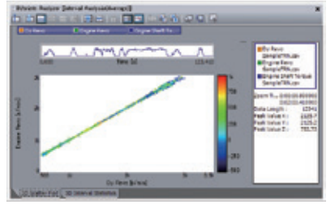
- **•1 Variate analysis** : Histogram, Auto correlation, Normal probability plot
- **•2 Variate analysis** : Scatter plot, Regression analysis, Lissajous, Cross correlation, Stereogram, Interval statistics
- **•3 Variate analysis** : 3D scatter plot, 3D interval statistics
- **•Frequency analysis** : Peak method/ Local maximum value method/ Local minimum value method/ Amplitude method/ Rain flow method/ Maximum-minimum method



Frequency analysis



Lissajous



3D scatter plot

FFT Analysis OS-0252

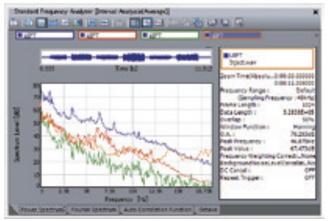
Included in OS-2720, OS-2740 and OS-2760

Capable of standard frequency and cross frequency analysis up to 32 channels. Elapsed time is able to be easily checked by the time trend, color map function and video file (AVI) output for FFT. [Absolute value: ABS ( )] and [Square root value: SQRT ( )] are included to the calculation function. These functions allowed power addition of 3-axis data, and vector calculation of magnetic field evaluation measurement has become available.

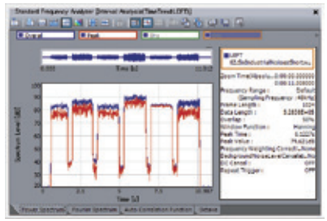
Standard frequency analysis:
Power spectrum, Fourier spectrum, Phase spectrum, Auto-correlation, Bundle octave analysis

Cross frequency analysis:
Frequency response, Inter-channel phase spectrum, Cross spectrum, Coherence, Cross-correlation, Impulse response

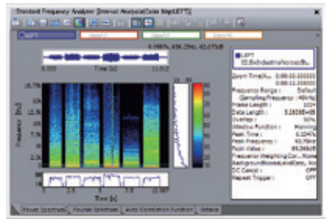
- **•Window function:** Rectangular, Hanning, Hamming, Flat-Top, Exponential, Blackman Harris, Force
- **•Number of lines:** 50 to 25,600
- **•Frequency weighting:** A, B, C
- **•Calculus:** 1 differential/ integral, 2 differential/ integral
- **•Average:** Arithmetic mean, Peak hold
- **•Density:** OFF/ PSD/ ESD



Power spectrum (4ch overlay)



Trend (OverAll, Peak)



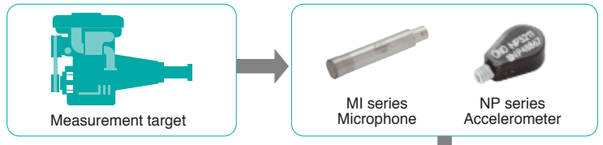
Power spectrum color map

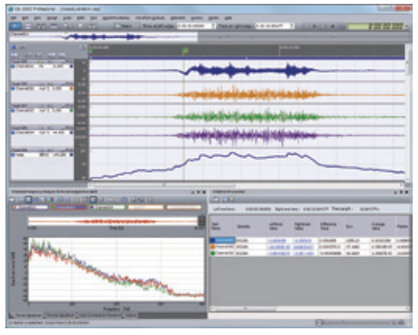
Analysis example

Example

[Frequency analysis of acoustic/vibration]

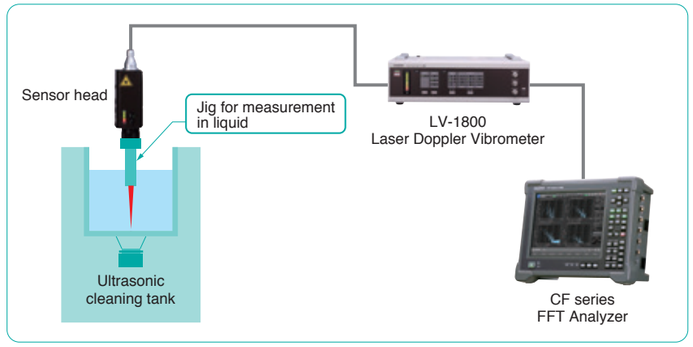
Frequency analysis is the most effective method for reduction and countermeasure against noise and vibration.
OS-2000 series can analyze an acquired data by using various analysis functions from various angles.
Offline analysis of specified range can be performed while observing the entire recorded data by data editing function.





[Vibration measurement in liquid (ultrasonic cleaning tank)]

This is an example of vibration analysis of ultrasonic cleaning tank.
After performing vibration measurement of the ultrasonic cleaning tank by the LV-1800 Laser Doppler Vibrometer, the result is stored into the FFT Analyzer as a time-axis data.
You can import the recorded time axis data in FFT Analyzer to the OS-2000 series and analyze them using various analysis functions of the OS-2000 series.



Entire waveform

Zoomed waveform

Time Frequency Analysis OS-0263

This function discovers the features which is difficult to catch by FFT analysis, and displays clearly time change of the frequency component while maintaining its frequency resolution. The calculation processing speed of Wavelet transform is greatly improved when Multi-core CPU or GPU is installed in a PC*1. The calculation processing speed is 5 times*2 faster than before by Multi-core CPU, 7 times*3 faster by GPU.

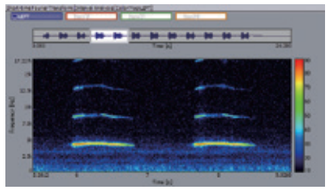
*1: Only for Wavelet analysis

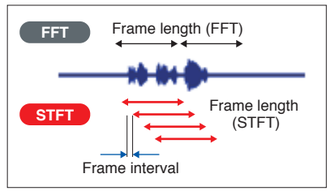
*2: When compared calculation processing speed by CPU Intel® Core™ i7-930 2.8 GHz with the speed before.

*3: When compared calculation processing speed by GPU GeForce® GTX560 with the speed before.

Short-time Fourier Transform

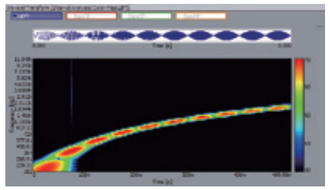
Fourier analysis is able to be performed with any points (frame length and interval) set by the user. In other words, the user can set any cutting out time length, so this method is effective for observing spectrum changes over an extremely short time.

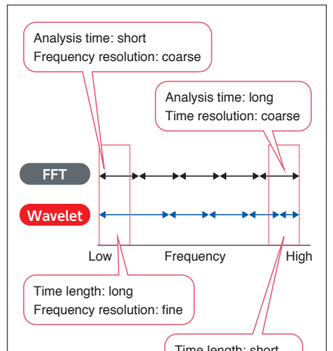




Wavelet Transform

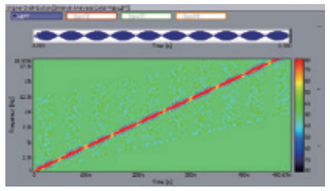
Wavelet transform is an analysis method that enables simultaneous analysis of temporal fluctuation and spatial transition of complicated waveforms such as a sudden or unstationary sound or vibration. The analysis time length is changed depending on the frequency in this method. It brings a good balance between time and frequency, so this method is effective for capturing the analysis result as a whole.





Wigner Distribution

Wigner distribution offers the highest resolutions for both time and frequency, making it possible to capture the characteristics of transient signals more efficiently than other methods. However, negative energy and cross items appear frequently, and you must use the method with caution.



Analysis example

Example

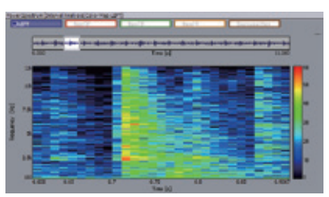
[This example shows the analysis of extremely short noise included in the sound generated from operating machinery]

Wavelet transform included in the OS-0263 is effective when observing transient phenomena with wide frequency bands, does not overlook components even that could not be found by FFT analysis.

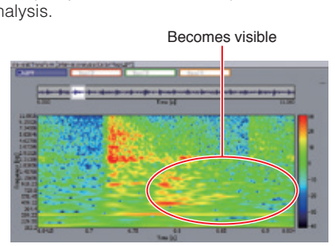
When the time length of the generated noise is extremely short, with FFT analysis, the frame length cannot be sufficiently increased and the time resolution becomes lower. Furthermore the frequency components of the noise are included over a wide frequency range, so the resolution of the low frequency component is reduced.

Wavelet transform can capture the information of time and frequency exhaustively. In this example, you can see the component of the red encircled portion (low frequency component) which could be overlooked by FFT analysis.

Noise generation time: Approx. 40 ms



FFT analysis results of operating machine noise (Time-frequency color spectrum)



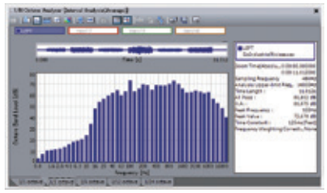
Wavelet analysis results of operating machine noise (Time-frequency color spectrum)

1/N Octave Analysis OS-0264

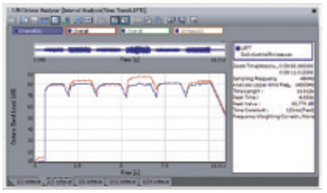
Included in OS-2740 and OS-2760

1/1, 1/3, 1/6, 1/12, 1/24 Octave analysis function suitable for analysis of sounds and vibrations.

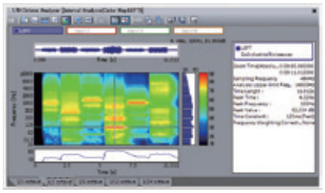
- **Time constant** : None / 10 ms / 35 ms / 125 ms (Fast) / 630 ms / 1 s (Slow) / 8 s / 10 s / Impulse
- **Frequency weighting**: A-weighting, B-weighting, C-weighting, G-weighting, Vv-weighting, Vh-weighting, V hand, custom
- **Time rate** : 5 %, 10 %, 50 %, 90 %, 95 %
- **OverAll, AllPass**



1/3 Octave



1/3 Octave Time trend
(A-weighting, FLAT)

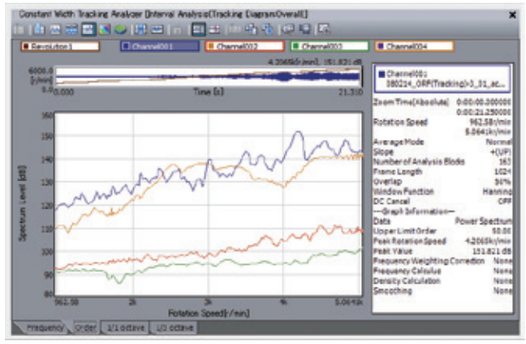


1/3 Octave Color map

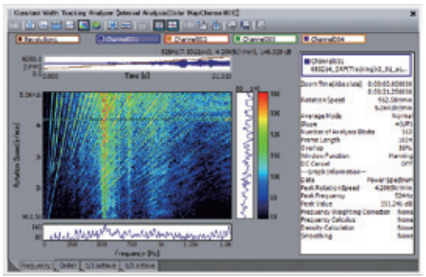
Tracking Analysis OS-0265

This software includes both constant width tracking analysis of which frequency resolution is constant regardless of the rotation speed, and constant ratio tracking analysis of which order resolution is constant regardless of the rotation speed. Up to 4 signals are available for overlapping display in tracking diagram.

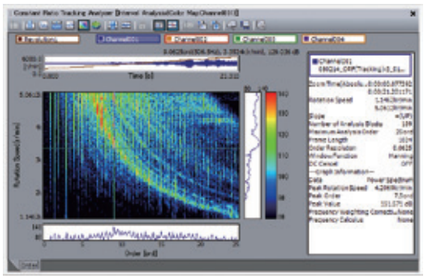
- **Various search cursors for frequency, order, harmonic, band and side band are available.**
- **Order and frequency are able to be displayed in the same tracking diagram.**



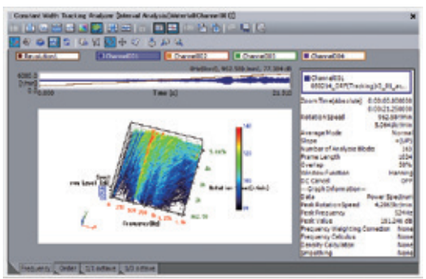
Tracking diagram



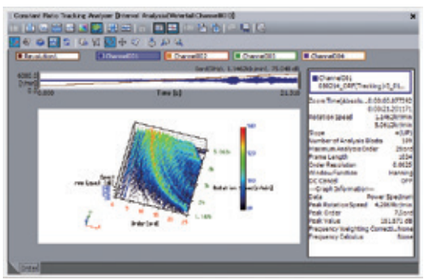
Color map (Constant width tracking)



Color map (Constant ratio tracking)



Waterfall display (Constant width tracking)



Waterfall display (Constant ratio tracking)

Sound Quality Evaluation OS-0271

Included in OS-2740 and OS-2760

It is difficult to quantify subjective feelings such as comfortable sound and disturbing noise. Sound quality evaluation software can quantify the sound by using six parameters of psychoacoustic evaluation; loudness, sharpness, roughness, fluctuation strength, AI (Articulation Index), tonality as well as conventional physical quantities such as frequency analysis or octave analysis.
These parameters enable quantitative determination that helps effective cause investigation and fundamental sound improvement for uncomfortable sound reduction countermeasures.

Applicable standards

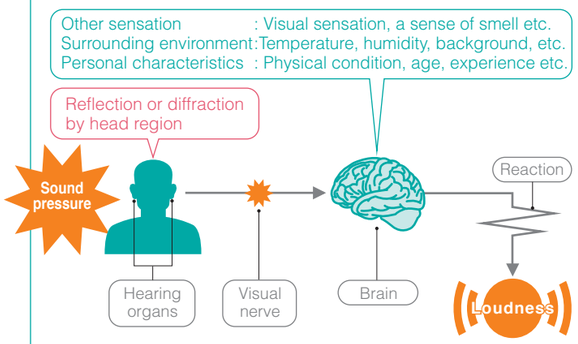
- Loudness of stationary sounds (ISO-532-1, ISO532B)
- Loudness of non-stationary sounds (ISO-532-1, DIN45631/A1)

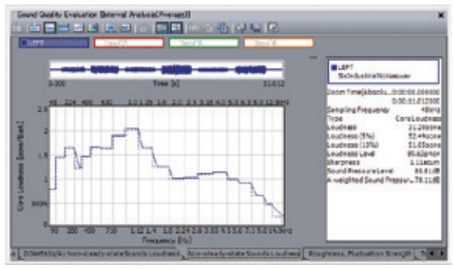
Six parameters for sound quality evaluation

Loudness	Sharpness	Roughness
Fluctuation strength	Tonality	AI

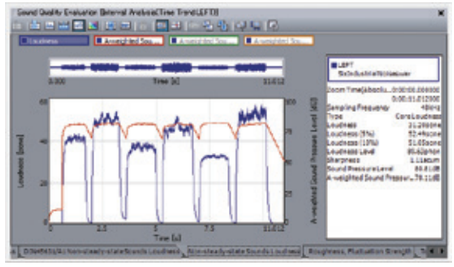
What is Loudness?

Loudness (the magnitude of the sound) represents the sensory amount (total sum of excitement of the auditory nerve) that represents the intensity of the subjective feeling of the sound.
Pure tone of 1kHz 40dBSPL is defined as one. As for other sounds, it is represented by how many times the sound is to the sound amount defined as a reference. Sone is used as the unit.

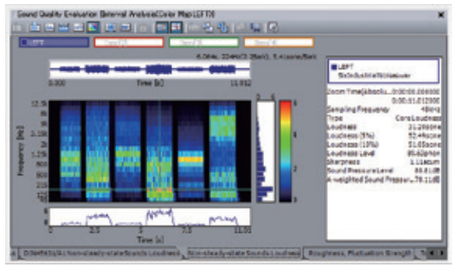




Loudness density



Trend (Loudness level, A-weighting)

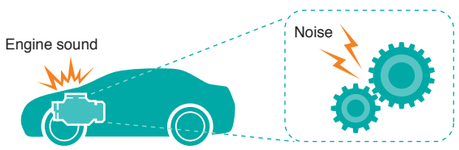


Loudness color map

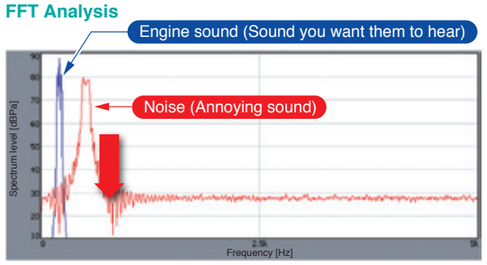
Analysis example — Example

[Effective evaluation of noise reduction]

When noise is generated mixed with an engine sound, you cannot find any characteristics by FFT analysis and do not know how much noise should be reduced enough not to be annoyed. Loudness analysis can perform noise reduction efficiently by using masking effect of engine sound.

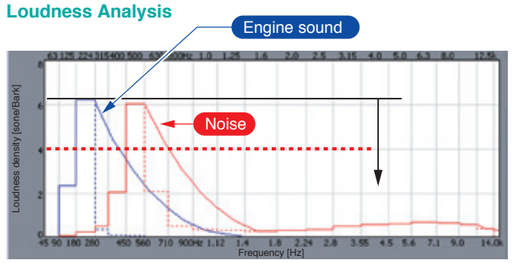


FFT Analysis



Cannot obtain the target reduction level of the noise.

Loudness Analysis

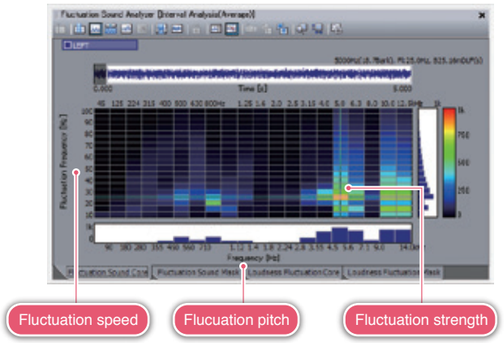


Fluctuation Sound Analysis OS-0272

Included in OS-2760

The fluctuation sound analysis provides an analysis method for clarifying components having significant time fluctuations by showing them with the two axes as frequency and fluctuation frequency on a graph. You can see in details the components of very small but annoying chattering sound or clicking sound by this software, which cannot be detected by FFT analysis.
Effective for extracting only the fluctuation components, which are unrecognized in large level of background noise.

With the combination of fluctuation sound simulator, you can evaluate the sound while adjusting the fluctuation components, such as eliminating only annoying fluctuation components, amplifying easy-to-hear components.



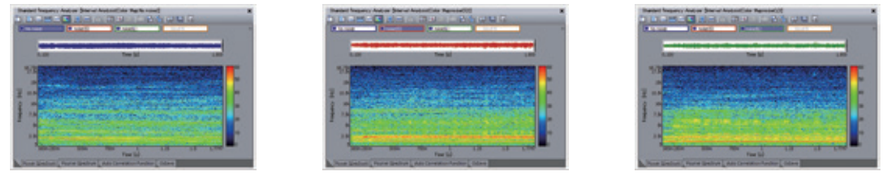
Analysis example — Example

[Abnormal sound measurement of a motor]

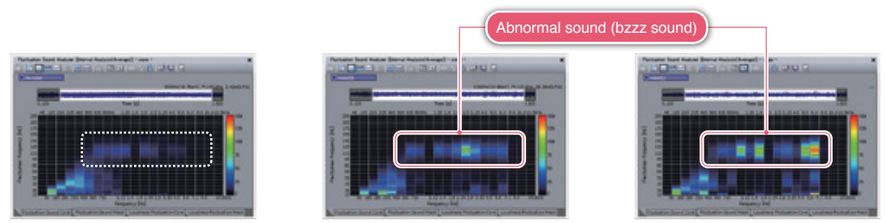
FFT analysis cannot make a correct pass/fail judgment of the abnormal sound in each operation sound below; the abnormal sound (none), abnormal sound (small), and abnormal sound (large). Fluctuation sound analysis helps to clarify the characteristic amount of each level by colored result screen. You can see each color map which clearly shows its characteristics for each level by fluctuation sound analysis.

Pass/Fail judgment of abnormal sound (bzzz) generated from a small motor

FFT Analysis



Fluctuation Sound Analysis

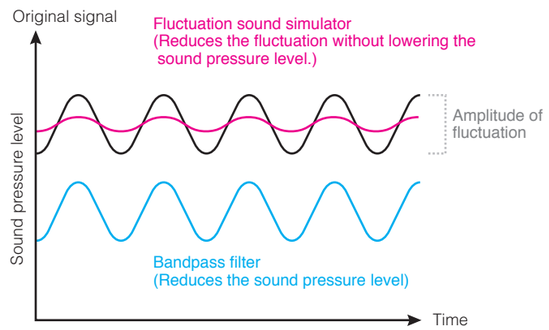


Abnormal sound (none) | Abnormal sound (small) | Abnormal sound (large)

Fluctuation Sound Simulator OS-0273

Included in OS-2760

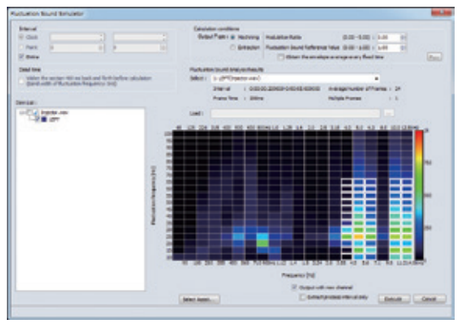
This function can simulate the sound, such as removing or enhancing the time fluctuation component which has been identified by the fluctuation sound analysis. You can make a sound source file by extracting only the specified fluctuation component from original sound. Unlike ordinary band-pass filter that increases or decreases the sound pressure level in specified bands, this filter can increase or decrease only fluctuation components while minimizing changes in the sound pressure level.



Output type (Time waveform generation)

Processing: Outputs the sound after being removed or enhanced the selected range of fluctuation components. The sound of the range not selected is output as original sound.

Extraction: Outputs only the sound fluctuation component from that has been removed or enhanced of the selected range. The sound of the unselected range is not included.

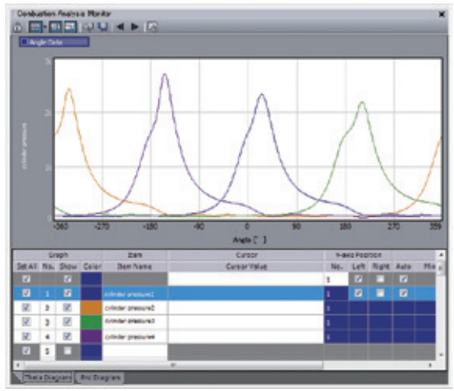


Combustion Data Display OS-0255

Included in OS-2770

This option can display combustion measurement data (angle-axis data) measured by DS-0328 combustion analysis system on the OS-2000 series as θ diagram or P-V diagram.
The TDMS file recorded with the SYNC measurement function (DS-0335) can be imported and the waveform of the in-cylinder pressure can be displayed as a continuous file.

* DS-0328 Combustion Analysis Software ver.4 or later



θ diagram (Overlay)

Analysis example

Example

OS-2770

[Combustion Analysis]

You can display and analyze the time-series data converted from angle-axis data, side-by-side with time series data related to performance or ECU.
It helps to make analysis on a bench efficient, which used to take time for conversion processing from angle data to time data, such as data collation with other measurement instrument and analysis using multi-point data.

DS-3000 series
Combustion Analysis System

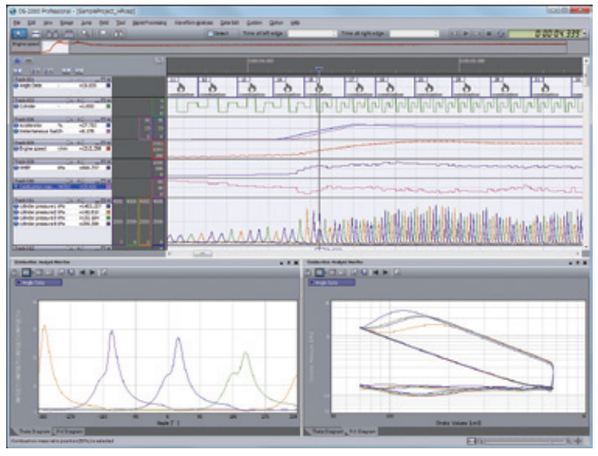
FAMS-R5
Flexible Automatic Measurement System-Release 5

ECU
- Supercharged air control
- Ignition timing
- Fuel injection quantity

Import

File format

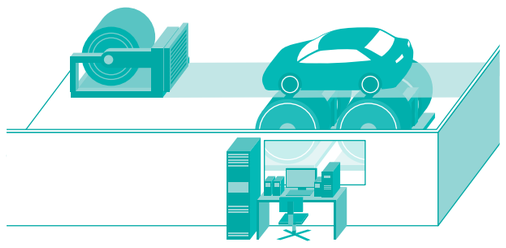
- TDMS
- THD
- MDF

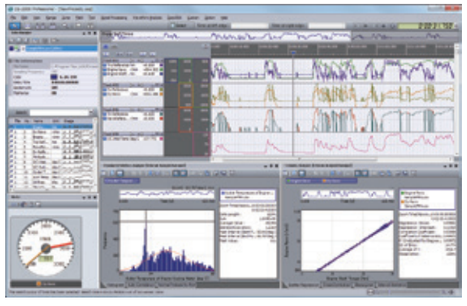


OS-2710

[Bench Data Analysis]

Time-series data that is used in various research or development field is very large in general, such as the data recorded inside of a running actual vehicle, the data recorded outdoors, and the data recorded in a laboratory. OS-2000 series can handle such large amount of data regardless of the capacity of a PC.





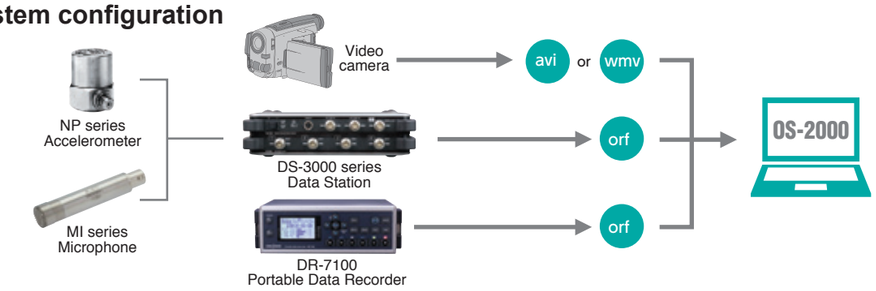
Various measurement data such as rotation, pressure, displacement, humidity, noise and vibration.

Video Playback OS-0281

By using the OS-0281, you can read the video file that you have recorded by a home video camera to the OS-2000 series, and replay it together with the analysis results of sound or vibration*1 *2. You can check the various phenomena occurred at the time of measurement, which are difficult to observe only by analysis graph.

*1: Additional video conversion software may be required depending on the video file format.
*2: Some avi and mwv formats are not supported.

System configuration

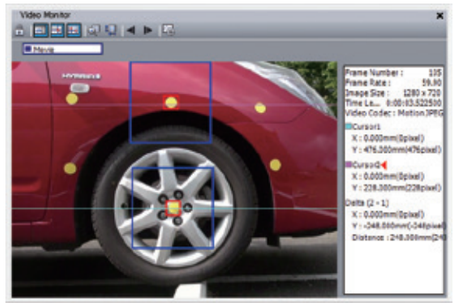


Display of distance between 2 points:

Distance and displacement in an image are able to be checked using 2 search cursors.

Brightness and contrast adjustment:

You can adjust the brightness and contrast of a dark image taken with insufficient amount of light.

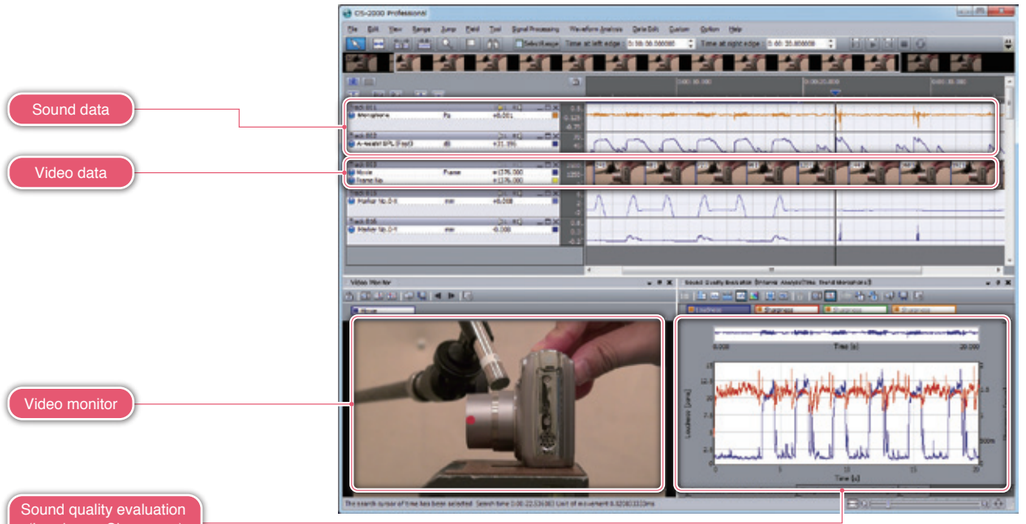


Analysis example

Example

[Analysis of operation sound of compact digital camera]

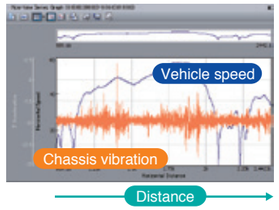
The sound quality can be evaluated quantitatively, including the sound when the lens tube extends. By recording the movement of the lens tube at the time you pressed the zoom button in advance with the video camera and microphone, you can check the video and sound quality evaluation analysis together.



Use the Synchronizer function (basic function) to align the time and positions of waveform when the recording start timings of sound data and video data are different.
You can adjust the position of waveforms so that they are at the same time at a certain point, such as the start trigger signal.

Non-time Series Graph OS-0291

Although time is generally set to the horizontal axis on a standard OS-2000 series, non-time series graph software (OS-0291) can set items other than time as the horizontal axis in a graph. For example, you can graph the vehicle body vibration with respect to each travel distance or vehicle speed, etc.



Control API OS-2700

This function provides an application interface library (control API) to control access of Time-series data analysis tool OS-2000 series from other programs and a command monitor for displaying its conditions.
Since Control API is Network responding, OS-2000 series can be controlled from other PCs on a LAN without complicated setting.
As Control API is provided as DLL component, it allows for the use of managed code (Microsoft Visual C#) that is handled on NET Framework.

Operating environment

* Microsoft Visual C#®2008 or later
* .NET Framework 3.5 service pack 1 or later

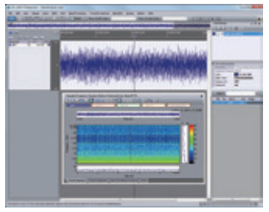
Continuous Automatic Analysis OS-0254

This function is useful when you want to analyze large number of time-series data files. Multiple data files are automatically analyzed and stored as a graph in a specified format. By storing the analyzed 1 data file as a template, the setting operation is automatically performed to multiple data files. Those files are able to be stored in image format or text format.

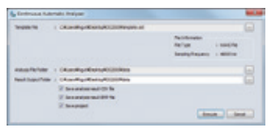
- Up to 100 files are able to be processed at one time. Only .orf and .wav formats are supported.
- Only FFT analysis (power spectrum) and Octave analysis (1/1, 1/3) are supported.
- Graphic format (*.bmp) and text format (*.csv) are supported.

Operation Procedure

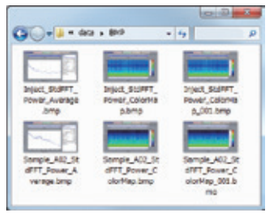
Step 1 Store the analyzed conditions as a template file.



Step 2 Specify the save location and analysis output location of the template file and data file on continuous automatic analysis screen.



Step 3 Check the analysis result



What is template file?

Template can store the setting conditions of drawing, layout, and analysis on a current project. (Some settings including data file, etc. cannot be stored.) Saving a template as a file enables loading different data to a project with same conditions of drawing, layout, or analysis.
Using a template file saves your time when you need to set same conditions to a project file every day.

Option

Type	Model name	Overview
Basic	OS-2500	This is the basic version, equipped with the Event counter, Search function, Effective value calculation and other essential capabilities.
Standard	OS-2600	This is the standard version with enhanced features added to the Basic version such as Inter-channel calculation, Search value extraction, and F/V function.
Professional	OS-2700	This is the professional version, equipped with numerous advanced functions, including File merge, Waveform generation tool, Hilbert transform, and Recording functions, in addition to the functions in the Standard version.

●: Provided as standard / ○: Optionally provided

	Product name		Model name	OS-2500 OS-2600 OS-2700	OS-2710 Bench package	OS-2720 FFT analysis package	OS-2740 Sound quality evaluation package	OS-2760 Fluctuation sound analysis package	OS-2770 Combustion analysis package
Waveform analysis	Statistical Analysis	Standard Statistic Analysis	OS-0251	○	●	○	●	●	●
		2 Variate Analysis/ 3 Variate Analysis							
		Frequency Statistics Analysis							
	FFT Analysis	Standard Frequency Analysis/Standard Frequency Analysis EX	OS-0252	○	○	●	●	●	○
		Cross Frequency Analysis/Cross Frequency Analysis EX							
	Time Frequency Analysis		OS-0263	○	○	○	○	○	○
	1/N Octave Analysis		OS-0264	○	○	○	●	●	○
	Tracking Analysis	Constant Width Tracking Analysis	OS-0265	○	○	○	○	○	○
		Constant Ratio Tracking Analysis							
	Sound Quality Evaluation	Sound Quality Evaluation Analysis	OS-0271	○	○	○	●	●	○
		Articulation Index Analysis							
	Fluctuation Sound Analysis		OS-0272	○	○	○	○	●	○
Signal processing	Fluctuation Sound Simulator		OS-0273	○	○	○	○	●	○
	FIR filter		OS-0253	○	●	●	●	●	●
Custom	IIR filter	IIR filter	OS-0261	○	○	○	●	●	○
		Graphic Equalizer							
		Parametric Equalizer							
	Continuous Automatic Analysis		OS-0254	○	○	○	○	○	○
	Combustion Data Display		OS-0255	○	○	○	○	○	●
	Video Playback		OS-0281	○	○	○	○	○	○
	Non-time Series Graph		OS-0291	○	○	○	○	○	○

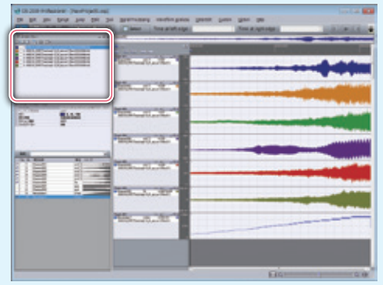
Wide variety of applications that OS-2000 series provides

Use with DS-3000 series

ORF file ORF file recorded by the DS-3000 is able to be exported to the OS-2000 series by only clicking the button. You can perform more detailed analysis and comparison of several files.

*The DS-0350 Recording function is required.
*Software version of the DS-3000: 2.2.6 or later
*Software version of the OS-2000: 2.7.0 or later

The OS-2000 series starts with one button click, and automatically imports the recorded file to the OS-2000 series!



Use with Sound Level Meter

wav format The WAVE file measured by the sound level meter is recorded to the SD card. The data has been already calibrated in the sound level meter, so there is no calibration needed in the OS-2000.

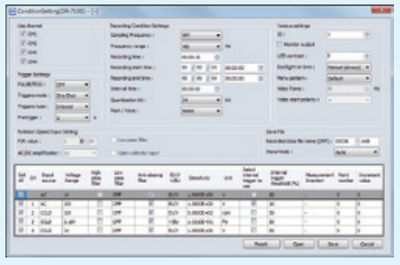
*Up to 2 GB of data recorded by LA series can be read with the OS-2000 series.

LA series
Sound Level Meter

Use with DR-7100

orf format Set the recording condition for the DR-7100 (Portable Data Recorder for Acoustics & Vibration) before use. The recording condition is able to be stored in the SD card, and is easily read by inserting it to the DR-7100.

DR-7100 Portable Data Recorder

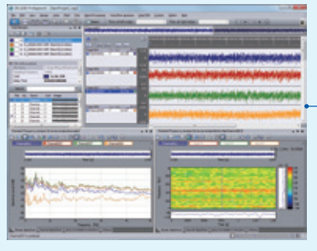


DR-7100 Condition setting dialog

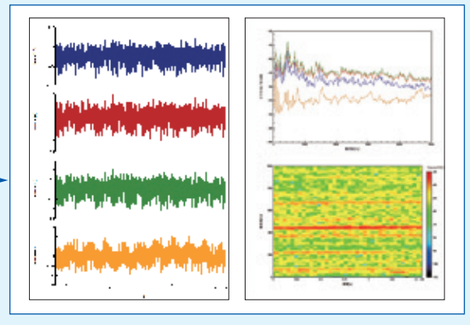
Use with OC-1300 series

When you want to edit the analyzed data, you can transfer the graph to the OC-1300.

- Display of the value at its position by search marker
- Editing of scale, waveform color and axis layout
- Printing as a report



Transfer to OC-1300



Specification

OS-2000 series ver.2.11

Item		Specification
Data import	Number of files	Up to 10 files
	Number of channels	Up to 1024 channels
	Number of data points	Up to 500 million data points (Number of files × number of channels × number of records)
	Sampling frequency	0.01 Hz to 20 MHz
		Movie file: up to 10,000 fps
Basic function	Waveform editting function	
	Numerical data display and editing function	
	Search cursor function	Delta display supported
	Marker function	Automatic marker placement function
	Sound playback function	Repeat available*1
	Search function	Logic settings supported, high and low values/ level trigger/ range trigger/ difference values for each condition
	Merging/ combining sections	
	Printing function	
Data export format	AVI file	*.avi
	CSV file	*.csv
	MDF file	*.mf4*2
	ORF file	*.orf
	TDMS file	*.tdms*3
	UFF file	*.uff*4
	WAVE file	*.wav
	OC-1300 transfer function	*5

Item			Specification
Data import format	ASCII file		*.txt, *.csv*
	WAVE file		*.wav*6
	Movie file		*.avi, *.wmv*7,*8,*9
	Excel file		*.xls, *.xlsx*10
	MDF file		*.mf4, *.dat*11,*12
	UFF file		*.uff,*.unv,*.bunv
	DS, CF series file		*.dat, *.rcd*13
	DS-0328 file		*.tdms
	ORF file		*.orf
	AU-4100A file		*.inf
	VARTS-Ⅱ file		*.dat
	FAMS series file		*.thd, *.lhd, *.fhd
	KY series file		*.trn, *.frz, *.ave, *.log, *.txt
	MCU file		*.mat
	WS-5160 file		*.s01, *.s02
	TEAC	TAFFmat file	*.hdr*14
		AQ-VU file	*.aqv*15
	HIOKI E.E MEMORY HiCORDER file		*.mem*16
	Meidensha MEIDACS file		*.meid*17
	Yokogawa WVF/WDF file		*.wvf, *.wdf*18
	IPG Automotive		*.erg*19
	GRAPHTEC corporation		*.gbd*20
	ATFX file		*.atfx*21

●: Provided as standard / –: Not provided

		OS-2500 Basic	OS-2600 Standard	OS-2700 Professional
Data function	Changing of channel settings/ Signal type setting	●	●	●
	Combine file generation tool/ File merge tool/ Waveform generation tool	–	–	●
Signal processing	Simple calculation/ Moving average/ Event counter/ Signal calibration/ Effective value calculation/ Statistical processing (interval)/ OC-1300 controller*5/ Synchronizer/ DR-7100 Recording condition settings/ Meter	●	●	●
	Search value extraction/ Time-axis calculus/ F/V converter/ Level adjustment/ Inter-channel calculation/ Re-sampling	–	●	●
	Hilbert transform/ Taper processing/ Playback(absolute sound pressure)/ Recording*22	–	–	●
Others	Control API	–	–	●

*1. The cycle accuracy differs depending on any of the followings: Operating environment, processing conditions, and sampling frequency.

*2. Measurement data format version 4.0. is supported.

*3. TDMS file is a National Instruments' file format.

*4. Only Universal File Format dataset 58 time-series data is supported.

*5. OC-1300 (option) is necessary.

*6. Microsoft®, Windows® standard RIFF format PCM sound data (uncompressed) is supported.

*7. Up to four screen simultanious playback is available. However, the number of available playback screens depends on the image size or frame rate.

*8. Available movie formats are avi and wmv. These formats are not available for all models.

*9. The optional movie conversion software is required depending on the format of the movie file.

*10. In order to handle Microsoft® Excel® workbooks, Microsoft® Excel® 2003 or later (sold separately) must be installed on the same PC.

*11. Measurement data format version 3.3, 4.0, 4.1 is supported.

*12. Supports the channels as follows: the value of CC block (cc_type) is 0 (1:1conversion), 1 (linear conversion), or 2 (rational conversion). (cc_type represents a method of data conversion.)

*13. Limited to internal sampling data.

*14. [DR-C, DR-F/M, DS] series, GX-1, LX-10/20, LX-110/120, es8, WX-7000 series, VR-24 and LX-1000 series. For applicable models, refer to the manufacturer's web site, etc. before purchasing.

*15. The image size is as same as the image which is output from the AQ-VU viewer software.

*16. MR6000, MR8740T, MR8880, MR8875, MR8870, MR8847, MR8847A, MR8827, MR8741/MR8740, 8870, 8861-50/8860-50, 8861/8860, 8855, 8847, 8842/8841, 8835-01, 8826, 8808/8807.
For applicable models, refer to the manufacturer's web site, etc. before purchasing.

*17. Supports high-speed measurement and continuous measurement data files measured with Meidensha MEIDACS-DY (6100P, 6200P, 6300P, 6400P, 6500P, 6600P) series ver. 3.0 or later. (Note: Average measurement data files cannot be read.)

*18. [DL750/750P, 850/850V, 850E/850EV, 9000, 7400, 1700, 1700E, 1600] series, [DLM2000, 3000, 4000] series, WE7000, SL1400, SL1000, DL350, Xviewer. For applicable models, refer to the manufacturer's web site, etc. before purchasing.

*19. Supports ERG file of Type 2.

*20. GL7000 Plus, GL7000, GL2000, GL980, GL900

*21. ASAM-ODS compatible option is required. Please contact the nearest distributor or OnoSokki sales office.

*22. Recording function OSRECO (OSRECO.exe) is available. Max. 8 channels can be recorded.

Operating Environment

Item	Specification
OS	Microsoft® Windows® 7/10 (running as a 32-bit application in the 64-bit version) .NET Framework 3.5 Service Pack 1 must be installed.
CPU	Recommended: Intel® Core™ i5 2.5 GHz Minimum: Intel® Core2 Duo™ 2 GHz
Memory	Recommended: 4 GB Minimum: 2 GB
Hard disk	Free space 1 GB or more
Display	Recommended: 1280 × 1024 Minimum: 1024 × 768
USB teminal	For protect key connection (accessory)
CD or DVD-ROM drive	For software installation
DirectX	DirectX 9.0c or later (When using the OS-0281)

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URL: https://www.onosokki.co.jp/English/english.htm

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