DS-3000 Series
Sound and Vibration Real-time Analysis System

Please refer to the OS-2000 Series brochure for details.

Please refer to the OC-1300 Series brochure for details.

* The PC environment may be subject to certain constraints, depending on the type of application software or hardware used. For more details, please contact your nearest distributor or send an e-mail to us.

* When using in FFT-A mode / 64 channels or more system, select the PC with CPU performance higher than Intel® CoreTM i7-7500U processor.

* Please note that the DS-3000 Series does not work normally when the OS other than the above is used by using compatible mode or Microsoft® Virtual PC etc.

* Some application software may not be applicable to the above operating environment. For more details, please contact your nearest distributor or send an e-mail to us.

Software
Multi-Channel Data Station

Hardware
DS Series

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

(overseas@onosokki.co.jp)

Supports USB 3.0

ONOSOKKI
The DS-3000 Series can perform real-time analysis of noise and vibration generated from products in various industries such as vehicles, railways, home appliances or plant facilities. “Quick reference of the required analysis screen” “easy checking of the measurement condition”, such quick and easy responses are one of the most important needs for on-site measurement. The hardware at overwhelming processing speed and easy handling software of the DS-3000 Series exactly satisfy the needs.

**DS-3000 Series**

**Speedy**
- Fast real-time processing & multi-channel recording with USB 3.0
  - Commercially available USB cable can be used when connecting to a PC.
  - Both USB 3.0 and USB 2.0 are available.
  - The type of USB connected is easily checked, which is automatically indicated on the front panel.
  - LED color tells the type of the connecting USB.

**Easy**
- Software design placed a high value on on-site measurement
  - All the installed analysis functions can be used quickly by activating the software.
  - Measurement conditions can be easily changed during watching the measurement screen in real time.
  - To support speedy and smooth measurement on site, commonly-used setup items can be placed as tabs on the window.

**Flexible**
- Unit connection function “FRAME LINK2”
  - FRAME LINK2 can temporarily build up a multi-channel measurement system by connecting units of the DS-3000 series with exclusive cables and box. Up to four units (128 channels) can be connected.

**Reliable**
- Simultaneous processing of real-time analysis and recording
  - This function enables recording of backup data automatically while performing real-time analysis.
  - **FFT analysis:** DS-0321A and DS-0350 are required.
  - **Octave analysis:** DS-0323 and DS-0350 are required.
  - **Tracking analysis (constant width):** DS-0321A, DS-0322, and DS-0350 are required.
  - DS-0321A: FFT Analysis
  - DS-0322: Tracking Analysis
  - DS-0323: 1/1 and 1/3 Real-time Octave Analysis
  - DS-0350: Recording Function

The DS-3000 Series can perform multi-channel data recording of various sound or vibration. Accurate and wide range of simultaneous multi-channel data recording is allowed owing to the wide dynamic range and high-speed processing.

**Data recording**

**FFT Analysis**
- Fast Fourier Transform Analysis
  - FFT analysis takes apart the time waveform to each frequency component and is useful for watching the level of each component. This analysis is effective to watch resonance frequency of vibration or details of sound frequency component.

**Real-time Octave Analysis**
- “Octave” represents the 1:2 ratio of frequency, that is, a frequency band where the highest frequency is twice the lowest frequency. The result of octave analysis is closer to human hearing sense because human ears have logarithmic feature. Generally the 1/3 octave analysis (one-third of an octave) is used in the sound analysis.

**Rotation Tracking Analysis**
- In sound or vibration analysis from various rotating objects, it is necessary to know which number of rotations makes the noise louder. Then level of each order component for the rotation can be analyzed by recording rotation information (pulse vibration etc.) as well as the sound or vibration signals.

**Simultaneous processing of real-time analysis and recording**
- This function enables recording of backup data automatically while performing real-time analysis.
  - **FFT analysis:** DS-0321A and DS-0350 are required.
  - **Octave analysis:** DS-0323 and DS-0350 are required.
  - **Tracking analysis (constant width):** DS-0321A, DS-0322, and DS-0350 are required.
  - DS-0321A: FFT Analysis
  - DS-0322: Tracking Analysis
  - DS-0323: 1/1 and 1/3 Real-time Octave Analysis
  - DS-0350: Recording Function

**DS-3000 Series Sound and Vibration Real-time Analysis System**

**Hardware**
- DS-3000 Series
  - Multi-Channel Data Station
  - Controlling vibration
  - Low-noise measure
  - Acoustic comfort design

**Software**
- DS-3000 Series
  - FFT Analysis
  - Tracking Analysis

**Unit connection function “FRAME LINK2”**
- FRAME LINK2 can temporarily build up a multi-channel measurement system by connecting units of the DS-3000 series with exclusive cables and box. Up to four units (128 channels) can be connected.

**DS-0321A**
- FFT Analysis

**DS-0322**
- Tracking Analysis

**DS-0323**
- 1/1 and 1/3 Real-time Octave Analysis

**DS-0350**
- Recording Function
Making best suited setup for on-site measurement

During the measurement, it is necessary to alter the measuring conditions at the site accordingly to unexpected situations including occurrence of noise (environmental noise, disturbance vibration from other equipment) or change of test items. Also according to the various measurement contents such as noise and vibration, making appropriate measurement setting is required. The DS-3000 series can respond flexibly and quickly to such situations, and find the best-suited setup for accurate measurements.
Functions contribute to easier operation

**Unit connection function**

With the Unit connection function, you can temporarily build multi-channel measurement system by connecting multiple DS-3000 series units that you already have. Effective when you want to increase measurement channels. It can support multi-channel measurement while effectively utilizing existing facilities.

**“FRAME LINK2”**

Provides flexible building of multi-channel measurement system only by connecting units of the DS-3000 series via cables and Unit connection box (DS-0394), unit connection USB Hub (DS-0393). Up to 4 units of the DS-3000 series are able to be connected (max. 128-ch). The function has been greatly improved compared with FRAME LINK (existing model).

Connection example

![Connection Example Diagram]

- **List required for connection**
  - Unit connection interface cable: AX-9035/AX-9036
  - Unit connection box: DS-0394
  - Unit connection USB Hub: DS-0393

**“FRAME LINK”**

Connects two units of the DS-3000 series with an exclusive cable. Not only connecting two DS-3000 series each other, but also connecting the DS-3000 series and the DS-3100 series (previous model). *Maximum number of channels: 64

![Connection Example Diagram]

- **List required for connection**
  - Unit connection interface cable (AX-9035: 0.75 m)
  - Unit connection box: DS-0394
  - USB cable (2 m)
  - Unit connection USB Hub (DS-0393)

Notes for unit connection function

**FRAME LINK**

- Applicable unit connection interface cable for “FRAME LINK”: AX-9035 (0.75 m). (AX-9036 (2 m) cannot be used.)
- Unit connection interface cable is required. AX-9035 (0.75 m) is always required.
- Unit connection box (DS-0394) is always required.
- The commercially available USB Hub (DS-0393) cannot be used. Make sure to use the unit connection USB Hub (DS-0393).
- DS-0394 (FFT Analysis Function) software license is required. It does not operate only with the DS-0391.
- It operates in FFT-A mode. (It does not operate with other than the FFT-A mode).
- It is also possible to directly connect multiple units and PC with USB cables without using the unit connection USB Hub (DS-0393).
- Interface cables with different lengths cannot be used together.

**Auto measurement function**

This function enables users to start measurement, record data, and stop measurement automatically. With this function, repeated measurements can be automatically performed, thus saving time and effort.

**Application**

**Automatic data recording of unexpected abnormal vibration and sound**

This example shows how to record and save the power spectrum data of each channel automatically when vibration or sound exceeds the specified amplitude. Using the trigger function and automatic measurement function, phenomena can be captured reliably and repeatedly.

- **Vibration measurement of bearing**
  - Accelerometer
  - Drift of measurement values is required to expand the scale and adjust the scale.

- **Sound measurement of electric component**
  - Microphone

**Application**

**Automatic repeat measurement at the specified same time interval**

Repeated measurement can be performed automatically by specifying day and time of measurement start and measurement interval. Measurement time and data can also be set.

- **Sound and vibration measurement from wind power generation system**
  - Class 1 Sound level meter
  - Microphone
  - Accelerometer (tri-axis)
  - Accelerometer (single-axis)

**Mouse gesture function**

This function enables various operations including X-scale enlargement and Y-scale adjustment only with a mouse. The band you want to measure or gain can be enlarged or reduced with ease and intuitive action. Y-scale also can be adjusted by mouse operation, just double-click the graph.

Previous method

Input of setting values is required to expand the scale and adjust the scale.

![Previous Method Diagram]

- Drag a pointer to scroll an axis
- Drag a pointer along an axis

Easy operation only with mouse

![Easy Operation Diagram]

- Drag a pointer to scroll an axis
- Drag a pointer along an axis
- The reference on the axis is moved to adjust Y-axis scale

Double-click on a graph

- Y-axis scale is adjusted automatically

The reference on the axis is moved to adjust Y-axis scale

![Double-Click Diagram]

- Drag a pointer to scroll an axis
- Drag a pointer along an axis
- The reference on the axis is moved to adjust Y-axis scale

![Double-Click Diagram]
DS-0325A Tripartite graph function

Three amplitude values (acceleration: m/s², velocity: m/s, and displacement: m) at any arbitrary frequency can be read simultaneously in real time during FFT analysis of vibration. You do not need to perform calculus processing with the frequency analysis function individually, convert the amplitude value. Therefore you can read three amplitude values quickly.

[Advantages]
- You can immediately check the recorded data.
- You can compare and edit multiple data.
- You can automatically export the recorded files to the OS-2000 Series by clicking the button!

Data recorded on the DS-3000 Series Data Station can be immediately transferred to the OS-2000 Series Time-Series Data Analysis Software.

Huge amount of recording files can be transferred by one operation.

* DS-0350 (Recording Function) is required.
* DS-3000 Series software version: 2.2.6 or later
* OS-2000 Series software version: 2.7.0 or later

DS-3000 Series

Saves multiple data after recording and analyzing.

You can immediately compare the recorded data and analyze in detail!

OS-2000 Series

You can immediately check the recorded data.

You can automatically export the recorded files to the OS-2000 Series by clicking the button!

Hardware

DS Series

Multi-Channel Data Station

Various functions

File viewer function

This function displays entire range of the file (ORF file) being analyzed offline.

[Advantages]
- You can select the analysis range.
- You can convert the recorded data into TXT format or WAV format file.

Common setting function for multiple selections

You can select multiple screens or channels that you wish to change setting using [Ctrl] or [Shift] keys, and change them to common settings at once.

[Advantages]
- Easy to change the setting for multiple screens or channels.
- Prevent from missing or loss of settings.

Enhanced saving function

Large amount of data can be saved at once with one button operation.

[Advantages]
- Up to 3200 data can be saved at once.
- Saved contents can be displayed in list and output to files.
Measuring sound

FFT analysis and octave analysis of sound

**[Hardware]**
By means of fanless design* with low noise from the main body, a very tiny sound can be analyzed with high accuracy, even when the main unit is set nearby the measurement target.

**[Software]**
Enables an automatic recording of backup data while performing FFT analysis or octave analysis. You can analyze the recorded data off-line (later) with a PC.

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What is real-time octave analysis?

The octave analysis is a core method for acoustic measurement in various industries and studies. An octave means twice of the frequency. As its scale is similar to that of the human auditory sense, the octave analysis is commonly used for noise analysis.

In this example, sound pressure level for each frequency band in the audible frequency range of the measurement target is obtained by using 1/1 filter or 1/3 filter, which is specified to a standard.

Real-time octave analysis enables the analysis and trend measurement with time-weighting (Fast, Slow, etc.) equivalent to that of sound level meters.

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### System configuration

- Notebook PC
- Microphone Preamplifier
- 1/2-inch Measurement Microphone
- Sound Level Meter
- DS-3000 Series Hardware
- Multi-Channel Data Station

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### Measurement object

- Bonding machine
- Ultrasonic head part

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### Hardware

- **DS Series**
- Multi-Channel Data Station

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**Analysis Examples**

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Rotation tracking analysis

Rotation tracking analysis of noise and vibration

The DS-3000 Series enables tracking analysis from 60 to 240,000 r/min rotation speed and can be used for measurement from low to high-speed rotation. Changes in the order component of sound and vibration when the rotation speed is changed can be displayed in a tracking diagram. Up to 8 lines can be superimposed on a tracking graph.

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### System configuration

- Notebook PC
- Handheld Digital Tachometer
- Accelerometer
- Laser Doppler Vibrometer LV-1800

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### Vibration measurement in a range of ultrasonic

Vibration measurement in a range of ultrasonic using a Laser Doppler Vibrometer

By using the 100 kHz unit of the DS-3000 Series and the LV-1800 Laser Doppler Vibrometer, you can perform vibration measurement in a range of ultrasonic such as inverters, piezoelectric elements, MEMS, ultrasonic elements etc.
Visualization of sound in closing door of a vehicle

System configuration

- DS-3000 series
- accelerometer
- impulse hammer
- Ultraminiature microphone
- Notebook PC

Use of unit connection function FRAME LINK2

Multi-channel measurement system can be temporarily built by using unit connection function. The DS-3000 series hardware you already have can be efficiently used. Up to 4 units of 32ch DS-3000 series are able to be connected and max. 128ch data can be obtained at once. (FRAME LINK2)

Sound pressure map of a vending machine

Multi-channel measurement using FRAME LINK2 enables measurement of sound and vibration for 40 points at once, greatly improves work efficiency. It is not necessary to measure many times while changing measurement points.

ONO SOKKI’s analysis systems have been evolving for over 3 decades

Measurement of frequency response function

Measurement of natural frequency / damping ratio

Sound pressure map of overall value

Sound pressure map of 441 Hz

Parts and materials for automobile

Measurement of damping ratio

Measurement of natural frequency

Measurement of natural frequency and the damping ratio by the half-width method are allowed by using the impulse hammer and the accelerometer.

Measurement of natural frequency of the target object and calculation of the damping ratio by the half-width method are allowed by using the impulse hammer and the accelerometer.

Multi-channel measurement using FRAME LINK2 enables measurement of sound and vibration for 40 points at once, greatly improves work efficiency. It is not necessary to measure many times while changing measurement points.

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ONO SOKKI’s analysis systems have been evolving for over 3 decades
Servo Analyzer (DS-0342) Frequency Characteristics Analyzer

The Servo Analyzer is a software that measures the transfer function (frequency response function) of electric control circuits and mechanical system. The characteristics of the control circuit (phase margin, gain margin), resonance frequency of the structure, and impedance are able to be measured.

FRA mode

- Gain and phase for each single frequency can be measured.
- Servo Analyzer (DS-0342) Frequency Characteristics Analyzer
- Margin, gain margin) , resonance frequency of the structure, and impedance are able to be measured.

FFT mode

- Gain and phase can be obtained with high speed.

Useful functions

- Auto resolution control function
  - This is a function that increases the frequency resolution near a steep peak automatically.
  - Use this function to obtain accurate measurement results.
- 3-dB Auto search function
  - This is a function to automatically search the -3 dB lower points than the reference value selected with the cursor.
  - Gain and phase of each single frequency can be measured.

Measurement of rotation control characteristics of a motor using addition function (option) (Motor & Driver)

Motors incorporated in various products such as industrial equipment and automobiles have control circuits (closed loop circuit) for controlling rotation speed, torque, etc. When evaluating this control characteristic, in general, gain margin and phase margin are measured as the evaluation parameters of the controlling stability. By using the DS-3000 servo analysis system, this evaluation can be performed with ease and high accuracy.

Open loop characteristics and close loop characteristics can be converted with respect to data after measurement by calculation function.

The DS-3074 addition function option can output the signal obtained by adding a noise signal (for frequency response function measurement) from the DS-3073 (1ch output) to the feedback signal is output.

Image of measurement result

Gain margin and phase margin can be searched automatically.

Measurement of acoustic frequency characteristics using high sensitive microphone (Speaker, headphone)

The frequency characteristics of the speaker etc. can be easily measured.

Connect the DS-3000 output signal to the amplifier for the speaker.

Measure the speaker sound by the sound level meter or the microphone.

Phase rotation can be corrected by the delay amount between channels using the “Phase rotation correction function” included.

System configuration

- Microphone and preamplifier
- Speaker, headphone

Measurement result image

- Frequency range
- Sensitivity
- Linear response level
- Phased noise level
- A-weighting

Note

- Only added to the DS-0373 (1ch 100 kHz unit).
- Added to the DS-0373 (1ch 100 kHz unit) to the feedback signal is output.
- For example, between FFT analysis of shake correction control characteristics of mechanical control circuits (closed loop circuit) and noise signal (for frequency response function measurement) added to the feedback signal from the output side of the vibration analyzer, the vibration analyzer connects the signal and the noise signal (for frequency response function measurement) individually.
- The noise signal (for frequency response function measurement) is connected to the feedback signal is output.
OC-1300 series Toolbox
OC-1300 Toolbox enables data organization and graph creation by using data acquired by FFT Analyzer. Two kinds of software (DAT browser and TRC browser) support visualization of the acquired data.

OS-2000 series
The OS-2000 series features the ability to edit, process and analyze time-series data that are recorded by FFT Analyzer including DS-3000 series or CF-9200/9400. It also allows differential and integral calculus processing of recorded data and other complicated data processing and analysis, including reproduction and filtering of recorded sounds, analysis of fluctuation sounds. Various data formats* including original data formats of other companies are supported.

You can draw smooth contour map of sound pressure. By adding a contour map onto a loaded image data, the analysis result is obtained concretely.

OC-1300 series Graph Creation Tool
Graphs which have been created by OC-1300 Toolbox / OS-2000 series are exported to OC-1300 series only by one-click operation. Marker values, comment, and pictures are able to be added to make the graphs more impressive and beautiful.

The OC-1300 series makes it possible to create reports from huge amount of data smoothly and easily to anyone. You are able to lay out axis freely on a graph by dragging mouse and create graph easily. Even complicated multi-axis graph is able to be created quickly.
With wide variety of sensors, analyzers, and software, ONO SOKKI provides total solution on sound, vibration, and rotation measurement.

### Hardware

**DS-3000 Series**

- **40 kHz unit**
  - LV-1800
  - Signal Cable: AV-601
  - BNC cable (MX-100 Series)
- **100 kHz unit**
  - LV-1200
  - Signal Cable: AV-601
  - BNC cable (MX-100 Series)

**Software**

- **FFT Analysis** DS-0321A
- **Tracking Analysis** DS-0322
- **Real-time Octave Analysis** DS-0323
- **Sensor Analyzer** DS-0342
- **Recording Function** DS-0350

### Analysis for special purpose

#### 3D Sound Intensity Analysis Software DS-0225A

Sound intensity is the amount of acoustic energy at which the acoustic energy per a unit time emitted from a sound source passes through a unit area in sound field. Measuring this amount in 3D achieves to predict the sound source position, measure the acoustic energy amount emitted from the sound source, and measure the direction of acoustic energy which passes through the measurement plane.

The flow of acoustic energy is visualized and overlaid on an image of the measurement object (vector mapping).

Field Balancing Software DS-0227A

The troubles of rotation machinery is caused most frequently by the phenomenon of an imbalanced rotating shaft. The DS-0227A processes such bothersome balancing data calculation by software and displays the result. The correction of the imbalanced phenomenon can be made easily and efficiently.

#### 4th Beam Forming Sound Source Visualization System BF-3200

The unique beam forming calculation method can achieve the same position resolution of the sound source as the existing 360° microphone system with only four microphones. (in-house comparison)

Sound source search with analysis frequency of 500 Hz to 8000 Hz is possible, wider viewing angle measurement enables short-distance measurement, sound source conditions can be monitored in real time (more than 20 times / sec), and stationary sound and transient sound can be visualized.

The unique beam forming calculation method can achieve the same position resolution of the sound source as the existing 360° microphone system with only four microphones.

#### Noise Testing Software GN-1100 series

Noise Testing Software is a dedicated software for sound and vibration analysis of rotating bodies. Ideal for 100% inspection such as vibration analysis via CVT (Continuously Variable Transmission) and parallel operation analysis of turbines.

### Mission noise tracking inspection

Tracks and analyzes transmission vibration signals and performs quality control with that result. Sets an optional judgment line in the tracking data to judge OK/NG.

### Unbalance inspection of turbofan

If unbalance occurs in the turbofan, vibration increases. You can judge the quality from the size of the generated vibration.

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**Software**

- **Sensor Analyzer** GN-1100
  - NP-0021
  - Signal Cable: AV-601
  - BNC cable (MX-100 Series)
- **Recording Function** GN-1100
  - NP-0021
  - Signal Cable: AV-601
  - BNC cable (MX-100 Series)
**Hardware Specification**

Each unit of the DS-3000 Series is just about the size of B5 and 30 mm in height. Input and output units can be stacked up to 8 units (40 kHz unit) or up to 5 units (100 kHz unit) depending on a use and a purpose. (Generally, they are stacked in order of the main unit, the output unit, and the input unit from the top.) We also make the input unit which stacks 2ch or 4ch input unit on a main unit, and you can add channels using it as a base.

- **Input main unit (DS-3000 + DS-0362, DS-0364) or (DS-3200 + DS-0362, DS-0364)**
  - **Number of input channels:** 2ch / 4ch input system
  - **DC to 40 kHz**
  - **Input voltage range:** ±10 V
  - **Input signal which is standardized by voltage range is outputted from the terminal on the rear panel of the input unit. (1 Vrms max.)**

- **Input main unit (DS-3200 + DS-0362, DS-0364)**
  - **Number of input channels:** 2ch / 4ch input system
  - **DC to 40 kHz**
  - **Input voltage range:** ±10 V
  - **Input signal which is standardized by voltage range is outputted from the terminal on the rear panel of the input unit. (1 Vrms max.)**

- **Output main unit (DS-3204)**
  - **Number of output channels:** 2ch or 4ch output system
  - **DC to 40 kHz**
  - **Output voltage / current:** 0 to ±12 V, 0 to ±10 V

- **Accuracy between channels:**
  - ±0.1 dB
  - ±0.7 deg

- **Input voltage range:** 10 mVrms to 10 Vrms (7-range, 10 dB-step)

- **Function:**
  - Input main unit: Disturbance noise input and signal output after addition. (Single, one-shot: depending on software)
  - Input main unit: Disturbance noise input and output after addition to the preset signal.

- **Common specification of units**
  - **Signal output:** DS-0371 / DS-0372 / DS-0373 (option)
  - **Power supply for sensor (CCLD):** Electric current is supplied to a constant current supply-type sensor through an input connector (BNC). +24 V / 4 mA
  - **Frequency range:** 0.5 to 1044 Hz, 1 to 1024 with frequency doubling function
  - **Noise level:** In the case of a 90 dB level, range of detectable detector passed 60 to 180,000 dBc or 60 to 340,000 dBc

- **Input main unit (DS-3000 + DS-0362, DS-0364)**
  - **Function:**
    - Input main unit: Disturbance noise input and output after addition to the preset signal.
    - Input main unit: Disturbance noise input and output after addition to the preset signal.

**Unit connection function (FRAME LINK2)**

FRAME LINK2 can temporarily build up a multi-channel measurement system by connecting units of the DS-3000 series including the DS-0392A (unit connection interface) to a PC with exclusive cables and the DS-0394 (unit connection box). Up to four units can be connected. If USB terminals on PC are not enough, you can use the DS-0395 (unit connection USB hub) to connect multi main units.

- **Unit connection insertion (DS-0338a) option:**
  - **Cabling requirement:** AX-9035 (0.75 m) unit connection cable
  - **Alarms:** Built-in
  - **Recording function (DS-0350):**
    - **100 kHz unit:**
      - **Input main unit:**
        - **Signal output:** DS-0373 Signal output unit
        - **Supported resolution:** 12 bits
        - **(including a main unit):**
      - **40 kHz unit:**
        - **Input main unit:**
          - **Signal output:** DS-0371 / DS-0372 / DS-0373 (option)

- **Unit connection function (FRAME LINK2) option:**
  - **Alarms:** Built-in
  - **Recording function:**
    - **100 kHz unit:**
      - **Input main unit:**
        - **Signal output:** DS-0373 Signal output unit
        - **Supported resolution:** 12 bits
        - **(including a main unit):**
      - **40 kHz unit:**
        - **Input main unit:**
          - **Signal output:** DS-0371 / DS-0372 / DS-0373 (option)

- **Unit connection box (DS-0394):**
  - **Unit connection function (FRAME LINK2) option:**
  - **Alarms:** Built-in
  - **Recording function:**
    - **100 kHz unit:**
      - **Input main unit:**
        - **Signal output:** DS-0373 Signal output unit
        - **Supported resolution:** 12 bits
        - **(including a main unit):**
      - **40 kHz unit:**
        - **Input main unit:**
          - **Signal output:** DS-0371 / DS-0372 / DS-0373 (option)

**Notes on hardware specification**

- **Addition function option**
  - **DS-0374**
  - **Input signal and output signal are inserted from other input signals, etc.**

- **Hardware**
  - **Software**
    - **So/f_tware**
      - **100 kHz unit and 40 kHz unit cannot be used together.**
      - **For 40 kHz unit system: Fan is installed to the rear side in the 5 or more units system.**
      - **Only AX-9035 (0.75 m) unit connection cable can be used for FRAME LINK.**
      - **Unit connection function (FRAME LINK or FRAME LINK2) cannot be used for 100 kHz unit.**
      - **Unit connection interface (DS-0392A) supports FRAME LINK and FRAME LINK2. DS-0392A is not supported used with a USB hub.**

- **Unit connection box (DS-0394):**
  - **Unit connection function (FRAME LINK2) option:**
  - **Alarms:** Built-in
  - **Recording function:**
    - **100 kHz unit:**
      - **Input main unit:**
        - **Signal output:** DS-0373 Signal output unit
        - **Supported resolution:** 12 bits
        - **(including a main unit):**
      - **40 kHz unit:**
        - **Input main unit:**
          - **Signal output:** DS-0371 / DS-0372 / DS-0373 (option)
### Software specification

You can build the best system for on-site and real-time measurements based on a common screen structure and operability.

#### Hardware specification

- **Input function (Servo Analysis System)**
  - Input function: FRF (gain/phase), COH
  - Dynamic range: 100 kHz
  - Number of measurement channels: 4
  - Measurement condition charged depending on the number of channels.
  - Measurement accuracy ± 0.1 dB (at 1 kHz), ± 0.2 dB (at 10 kHz)

- **Software function (Module Analysis System)**
  - Number of output points: 64, 128, 256, 512, 1024, 2048, 4096, 8192, (32768, 65536) points
  - Frequency resolution: 6.25 kHz, 12.5 kHz, 25 kHz, 50 kHz, 100 kHz, 200 kHz, 400 kHz, 800 kHz, 1 MHz
  - Measurement frequency range: 10 mHz to 100 kHz
  - Number of output channels: 2 to 64
  - Number of input channels: 2 to 64
  - Number of output channels: 2 to 64

#### System structure

- **DS Series**
  - Frequency range / recording function
  - Analysis screen display
  - Calculation function
  - Unit connection
  - Number of measurement channels
  - Tracking diagram file
  - Schedule function
  - Rotation two inputs
  - Number of FFT sampling points
  - Sampling method
  - Calculation function
  - Cursor function
  - Averaging function
  - Window function

#### Analysis system (Module Analysis System)

- FFT Analysis function
  - 3D array display (monochrome/color), color mapping display, Campbell plot
  - 1 window, up to 10 windows

- The function that specifies the tracking diagram data saved as files, then makes and displays an averaged tracking data from them.

- ORF file (Ono Sokki Original Format): rotation information recording available

- Frequency range × 2.56 Hz

- The digital signal after A/D conversion of the analog signal can be continuously recorded to the hard disk of the personal computer. Recording available in the recording mode.

#### Analysis system (Module Analysis System)

- Peak list, arbitrary list, all list

#### Analysis system (Module Analysis System)

- JIS C 1509-1: 2005 Class1, IEC 61672-1: 2002 class1

**Notes**

1. **Note 1**: The signals of 2ch from the left/each input unit (when using 4ch input unit), and the signal of the leftmost channel/each input unit (when using 2ch input unit) are output. However, the signals of 2ch from the left/each input unit (when using 4ch input unit), and the signal of the leftmost channel/each input unit (when using 2ch input unit) are output.

2. **Note 2**: The function to automatically optimize the decade of each frequency band so that the characteristics of the entire frequency range can be observed with high accuracy.

3. **Note 3**: The function that always outputs offset voltage value even in the stop state.

4. **Note 4**: Output is OFF in the stop state

5. **Note 5**: * 100 kHz unit: Isolated between each channel

6. **Note 6**: The voltage range of each channel is automatically selected optimally according to the level of the input signal while measuring.

7. **Note 7**: The function that specifies the tracking diagram data saved as files, then makes and displays an averaged tracking data from them.

8. **Note 8**: The function that always outputs offset voltage value even in the stop state.

9. **Note 9**: Output is OFF in the stop state

**Software specification**

- **Input function (Servo Analysis System)**
  - Input function: FRF (gain/phase), COH
  - Dynamic range: 100 kHz
  - Number of measurement channels: 4
  - Measurement condition charged depending on the number of channels.

- **Software function (Module Analysis System)**
  - Number of output points: 64, 128, 256, 512, 1024, 2048, 4096, 8192, (32768, 65536) points
  - Frequency resolution: 6.25 kHz, 12.5 kHz, 25 kHz, 50 kHz, 100 kHz, 200 kHz, 400 kHz, 800 kHz, 1 MHz
  - Measurement frequency range: 10 mHz to 100 kHz
  - Number of output channels: 2 to 64
  - Number of input channels: 2 to 64

- **Display function (Servo Analysis System)**
  - Display of frequency response
  - On-screen graph (chart), frequency spectrum, real part and imaginary part
  - Gain and phase
  - Frequency range: 10 mHz to 100 kHz
  - Number of channels: 2 to 64
  - Number of input channels: 2 to 64

**Display system**

- **Display function (Servo Analysis System)**
  - Display of frequency response
  - On-screen graph (chart), frequency spectrum, real part and imaginary part
  - Gain and phase
  - Frequency range: 10 mHz to 100 kHz
  - Number of channels: 2 to 64
  - Number of input channels: 2 to 64

**Display system**

- **Display function (Servo Analysis System)**
  - Display of frequency response
  - On-screen graph (chart), frequency spectrum, real part and imaginary part
  - Gain and phase
  - Frequency range: 10 mHz to 100 kHz
  - Number of channels: 2 to 64
  - Number of input channels: 2 to 64
### Software

<table>
<thead>
<tr>
<th>Model</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS-0321A</td>
<td>FFT Analysis</td>
</tr>
<tr>
<td>DS-0321L</td>
<td>FFT Analysis (off-line license)</td>
</tr>
<tr>
<td>DS-0322</td>
<td>Tracking Analysis</td>
</tr>
<tr>
<td>DS-0330</td>
<td>Recording Function (throughput disk function)</td>
</tr>
<tr>
<td>DS-0342</td>
<td>Servo Analyzer</td>
</tr>
<tr>
<td>DS-0323</td>
<td>1 / 1 and 1 / 3 Real-time Octave Analysis</td>
</tr>
<tr>
<td>DS-0323L</td>
<td>1 / 1 and 1 / 3 Real-time Octave Analysis (off-line license)</td>
</tr>
<tr>
<td>DS-0324</td>
<td>1 / N Real-time Octave Analysis</td>
</tr>
<tr>
<td>DS-0325A</td>
<td>Tripartite Graph Function</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Model</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS-3200</td>
<td>Main Unit</td>
</tr>
<tr>
<td>DS-3202</td>
<td>40 kHz 2ch Main Unit</td>
</tr>
<tr>
<td>DS-3204</td>
<td>40 kHz 4ch Main Unit</td>
</tr>
<tr>
<td>DS-0362</td>
<td>2ch 40 kHz Input Unit (for expansion)</td>
</tr>
<tr>
<td>DS-0364</td>
<td>4ch 40 kHz Input Unit (for expansion)</td>
</tr>
<tr>
<td>DS-0371</td>
<td>1ch Signal Output Module for 40 kHz Unit (built-in)</td>
</tr>
<tr>
<td>DS-0372</td>
<td>2ch 40 kHz Signal Output Unit</td>
</tr>
<tr>
<td>DS-0366</td>
<td>2ch 100 kHz Frequency Band Signal Input Unit</td>
</tr>
<tr>
<td>DS-0373</td>
<td>1ch 100 kHz Frequency Band Signal Output Unit</td>
</tr>
</tbody>
</table>

### Hardware option

- Soft carrying case CC-0025
- Hard carrying case CC-0026
- Inside dimensions of PC storage space: 273 x 335 x 55 mm

### Graph creation tool (OC-1300 series)

<table>
<thead>
<tr>
<th>Model</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC-1340</td>
<td>OC-1300 Toolbox DAT-TRC browser pack</td>
</tr>
<tr>
<td>OC-0340</td>
<td>OC-1300 Toolbox DAT browser</td>
</tr>
<tr>
<td>OC-0341</td>
<td>OC-1300 Toolbox TRC browser</td>
</tr>
<tr>
<td>OC-1310</td>
<td>Basic</td>
</tr>
<tr>
<td>OC-1320</td>
<td>Standard</td>
</tr>
<tr>
<td>OC-1330</td>
<td>Professional</td>
</tr>
</tbody>
</table>

* Please refer to the OC-1300 Series brochure for details.

### Time-series data analysis software (OS-2000 Series)

<table>
<thead>
<tr>
<th>Model</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS-2500</td>
<td>Basic</td>
</tr>
<tr>
<td>OS-2600</td>
<td>Standard</td>
</tr>
<tr>
<td>OS-2700</td>
<td>Professional</td>
</tr>
</tbody>
</table>

* Please refer to the OS-2000 Series brochure for details.

### Operating Environment

**Interface:** [DS-3200] USB 3.0 should be installed, and has two or more of USB port (communication and license key). Supports USB 2.0 and USB 3.0.

(Data transmission using USB 2.0 is slower than using USB 3.0)

**OS:** Required to be equipped with any one of the following DS (Operating System) Microsoft Windows 10 Pro/Enterprise (64-bit / 32-bit)

Microsoft Windows 7 Ultimate / Professional (64-bit / 32-bit)

Recommended specifications:
- CPU: Intel Core™ i5 or more, memory: 4 GB
- When FFT-A mode of the FFT analysis function (DS-0321A) is used, CPU: Intel Core™ i7 or more, memory: 8 GB, DS: 64-bit

### Software for special analysis

<table>
<thead>
<tr>
<th>Model</th>
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</tr>
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<tbody>
<tr>
<td>BF-3200</td>
<td>BF Monitor</td>
</tr>
<tr>
<td>BF-0310</td>
<td>BF Offline Analysis (Time-series Data Analysis Tool OS-2000 is required)</td>
</tr>
<tr>
<td>DS-0235A</td>
<td>3D Sound Intensity Analysis Software</td>
</tr>
<tr>
<td>DS-0231A</td>
<td>Sound Power Measurement Software</td>
</tr>
<tr>
<td>DS-0227A</td>
<td>Field Balancing Software</td>
</tr>
<tr>
<td>UN-1100</td>
<td>Noise Testing Software</td>
</tr>
<tr>
<td>GN-0100</td>
<td>ORF Input &amp; Recalculation Function</td>
</tr>
<tr>
<td>GN-0110</td>
<td>Secondary Data Processing Function</td>
</tr>
<tr>
<td>GN-0120</td>
<td>GN link function / External communication function</td>
</tr>
<tr>
<td>GN-0140</td>
<td>Dual Rev Tracking Function</td>
</tr>
<tr>
<td>GN-0150</td>
<td>Calculation Rev Tracking Function</td>
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<tr>
<td>GN-0160</td>
<td>Dent Analysis Function</td>
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<tr>
<td>CC-0025</td>
<td>Soft Carrying Case (up to 3 units)</td>
</tr>
<tr>
<td>CC-0026</td>
<td>Hard Carrying Case (up to 3 units)</td>
</tr>
<tr>
<td>PS-P20017D</td>
<td>Large AC Adapter (5 units or more)</td>
</tr>
<tr>
<td>PS-P20032B</td>
<td>AC Adapter (up to 4 units)</td>
</tr>
<tr>
<td>PS-P20023B</td>
<td>Power Cable for adapter (2m)</td>
</tr>
<tr>
<td>PS-E1000865.4</td>
<td>DC Input Power Cable (6.4 m, alligator clip with fuse)</td>
</tr>
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</table>
  * Up to 4 units

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* Please refer to the OS-2000 Series brochure for details.

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**NOTE:** Some application software may not be applicable to the above operating environment. For more details, please contact your nearest distributor or send an e-mail to us (overseas@onosokki.co.jp).

*Please note that the DS-3000 Series does not work normally when the OS other than the above is used by using compatible mode or Microsoft® Virtual PC etc.

* The PC environment may be subject to certain constraints, depending on the type of application software or hardware used. For more details, please contact your nearest distributor or send an e-mail to us (overseas@onosokki.co.jp).

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

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