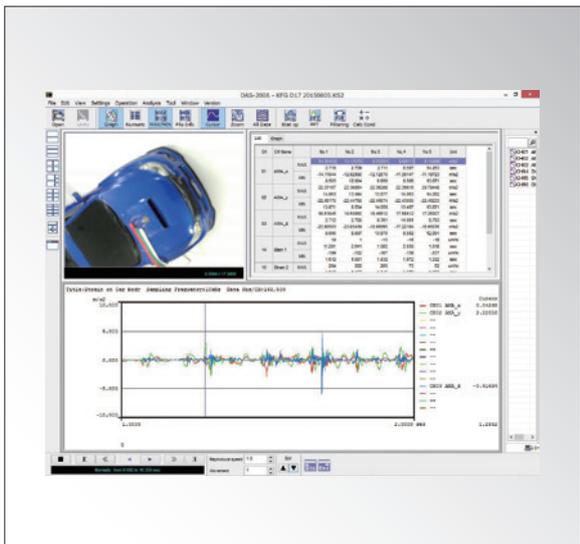


# DAS-200A

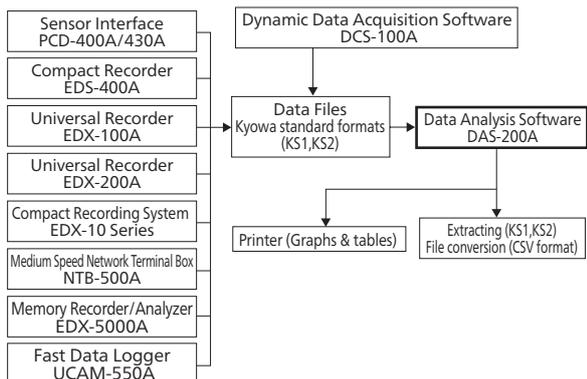
## Data Analysis Software



### Reproduces and analyzes the acquired data.

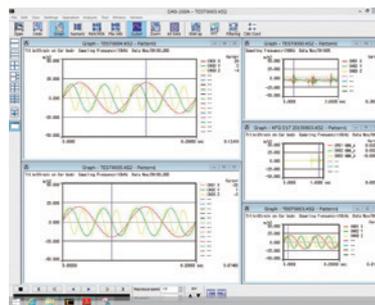
- Allow a data file to be processed for waveform display, FFT analysis, statistic operations, header information display, tabulation of numeric data and setting display conditions.
- Extracts and converts the data files into CSV files.
- Statistic processing
- Arithmetic operations
- FFT analysis
- Histogram analysis
- Filtering
- Differentiation & integration
- Saving & reading graph display and analysis conditional files
- Playback function of the acquired video data.
- Printer output
- Displays max. 16 data files on graphs.

The Data Analysis Software DAS-200A enables data reproduction and analysis of data. The DAS-200A displays Kyowa standard files (KS1, KS2) on graphs, in numerical values and analyzes them.

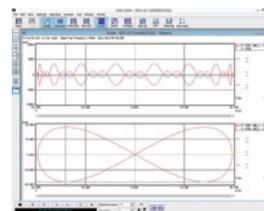


### Outline of Data Reproduction

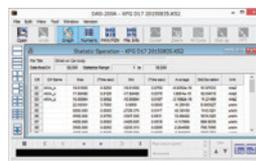
1, 2 or 4 Y-time graphs are shown on a window. The zooming function enables detailed observation of a necessary part by zooming in and the cursor enables reading the values on the time axis. The enlarged result on display is saved as a different file or converted to a CSV file.



Multi-graph (Max. 16) on a window



X-Y graphs



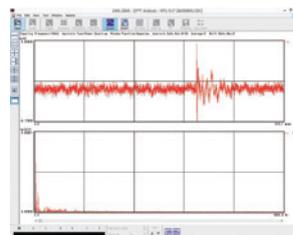
Results of statistic operations



Numeric data list

### Outline of Analysis

Data files are carried out to arithmetic operations, FFT analysis, histogram analysis and differentiation-integration. The analyzed results are saved in another file or converted to a CSV file.



FFT analysis

## Specifications

### ■ Operation Environment

<b>OS</b>	Windows Vista®, Windows® 7, Windows® 8, 8.1 or Windows® 10, English/Japanese 32, 64 bits support
<b>CPU</b>	Core2Duo 2 GHz or advanced
<b>Memory</b>	If 32-bit OS, 2 GB or more If 64-bit OS, 4 GB or more
<b>Display</b>	Resolution: 1024x768 pixels or more

### ■ Data Reproduction

**Graph Display** Up to 4 patterns of display conditions are set for each graph. Displays 1, 2, or 4 graphs on a single screen.

**Y-time Graphs** Max. 16 channels per graph.  
Allows Y axis to be auto scaled.

**X-Y Graphs** Displays 1 graph on a single screen.  
Displays of arbitrary 4 channels for both the X and Y axes, allows X axis and Y axis to be auto scaled.

**All Data Display** Displays all data by every 4 channels.

**Numerical Data Display** Up to 16 channels of data are listed.

**Cursor Display** Displays numeric data of cursor location.  
Zoom in data between 2 cursors.  
Display max. and min. data between 2 cursors.

**Scrolling** Scrolls X axis on Y-time graphs.

**Data File Editing** Extracts an arbitrary range or arbitrary channel from collected data file and converts to a CSV format file possible.  
Data file titles, comments, channel conditions display and editing are possible.

**Max. and Min. Display** Displays max. and min. data of each channel (5-data), 400-data around the max. or min. graphs.

**KS2 File** Block number support (1 block display, all block display). Displays and plays back the audio data.

**Operations** Playback, backward, repeat, frame-by-frame forward, frame-by-frame backward, jump to the beginning, jump to the end, set the beginning position, set the end position  
Playback speed: x0.1 to x20  
Plays back the measured data, video and GPS data at the same time.

**AVI Files** Playback frame rate, start frame No. (time)

**GPS Data Files** Displays the trail of latitude data and longitude data.

**Dual-sampling Data** Plays back the dual-sampling KS2 data (high-speed sampling data files and low-speed sampling data files) at the same time.

**Static Measuring Files** Reproduces the static measuring files (CSV format files).

**E4A Format Files** Reproduces CAN data of the ECAN-40A/EGPC-40A.  
Reproduces E4A format files and KS2 format files at the same time.  
Converts E4A format files into CSV format files.

### ■ Analysis Processing

#### Statistical Processing

List display of the maximum value, minimum value, average, and standard deviation for the desired portion of the reproduced data file.  
Statistical calculation results are converted to a CSV format file and saved

#### Arithmetic Calculations

Carries out calculations between channels in a maximum of 2 files, and saves the calculation results as a new file.  
Configuration of a maximum 320 expressions possible  
Expressions (Up to 200 digits)

**Operations and Constants** +, -, \*, /, ^ [Power], PI [π], and ( ) [parentheses]

#### Functions

SQR	Square root	LOG	Common logarithm
ABS	Absolute value	LN	Natural logarithm
SIN	Sine	EXP	Exponent
COS	Cosine	HMX	Max. principal strain
TAN	Tangent	HMN	Min. principal strain
ASIN	Arc sine (Return value: Radian)	HSM	Max. shearing strain
ACOS	Arc cosine (Return value: Radian)	SMX	Max. principal stress
ATAN	Arc tangent (Return value: Radian)	SMN	Min. principal stress
DSIN	Arc sine (Return value: Angle)	SSM	Max. shearing stress
DCOS	Arc cosine (Return value: Angle)	DEG	Principal strain direction
DTAN	Arc tangent (Return value: Angle)		

#### FFT Analysis

Analysis types: Linear spectrum, power spectrum, cross-spectrum, auto-correlation, mutual correlation, coherence, transfer function

Number of analysis data: 256, 512, 1024, 2048, 4096, 8192, 16384, and 32768

Window functions: OFF, Hamming, Hanning, Fejer, Blackman, Gaussian

Filters: 1, 2, 5, 50, 100, 200, 500, 1000, 2000 Hz, and FLAT - 10 steps  
Integration times: 0 to 2

Average number of times: 0 to (0: whole waveform)

Number of shift data: 2 or more

Analysis results graph display

Types	Graph 1	Graph 2
Linear spectrum	Amplitude (Linear) Amplitude (Logarithm)	Phase
Power spectrum	Amplitude (Linear) Amplitude (Logarithm)	
Cross spectrum	Amplitude (Linear) Amplitude (Logarithm)	Phase
Auto-correlation	Correlation	
Cross-correlation	Correlation	
Coherence	Coherence	
Transfer functions	Amplitude (Linear) Amplitude (Logarithm)	Phase

Saves the analysis results in CSV format files.

### Histogram Analysis

**Types** Peak-valley  
Maximum-minimum  
1D rainflow method  
Amplitude method  
Time at lever  
1D rainflow + peak-valley  
1D rainflow + maximum-minimum  
2D rainflow  
Slices 1D algorithm: Even numbers from 10 (±5) to 256 (±128)  
2D algorithm: Even numbers from 10 to 50  
Allows slice width, hysteresis, offset (For maximum-minimum), etc. to be specified.

Reading and saving of histogram analysis conditional files  
Result display: Tables and graphs (3D display for 2D rainflow)

**Life Prediction Processing** Predicts life from the result of histogram analysis of 1D rainflow method, 2D rainflow method, or amplitude method. The life prediction data is shown and saved as a file. (Allows S-N data files to be read.)

### Filtering

Digital filters: IIR filters  
Characteristics: 4th order Butterworth (Cutoff: -6dB, no phase delay)  
HPF & LPF: FLAT to 500 kHz (Up to 1/2 of the sampling frequency)  
Mirroring  
Loads and saves the filtering processing conditions.  
Analysis results are saved as additional format.

### Differential & Integration Processing

Number of differentiation & integration  
0: None, 1 to 2  
Analysis results are saved as additional format.

### Others

- Batch conversion of multiple data files
  - CSV format (Extension: csv)
  - Excel format (Extension: xls,xlsx)
  - RPCIII format
- File coupling  
Multiple files (Master and slave) acquired in synchronized operation are coupled into one file.
- Reverse file conversion  
Data files converted into CSV format are converted into KS2 files.
- File division  
Extracts the specified block No. data of the data file into single file.
- Batch analysis  
Analysis of multiple files under same conditions at one time. (Histogram analysis, filtering and differentiation/integration are available.)
- Overwriting of Multiple Files  
Up to 16 data files are displayed and overwritten as Y-time data.  
Sets the display start position of each data file arbitrary.

### ■ Readable Data Files

**File Formats** Kyowa standard format data files: KS1, KS2  
High-speed-sampling data files: KS2  
Low-speed-sampling data files: KS2  
FFT analysis result files: CSV  
Histogram analysis result files: HIS  
AVI files: AVI  
GPS data files: NMEA  
Static measurement files: CSV  
ECAN files: E4A

