EDX-3000B

Memory Recorder/Analyzer

High-speed Sampling at 200 kHz/32 Channels and Simultaneous Recording of Video with a High-speed Camera

- ●High-speed sampling at 200 kHz/32 channels
- ●Up to 64 input channels
- ●Simultaneous recording of measuring data and video
- ●Conditioner cards selectable for specific applications
- ●Highly user-friendly operation
- ●Versatile real-time processing capability
- ●Transformation into All-In-One Logger
- ●Operable without a monitor and a keyboard
- ●Confirmation of status from LED lamps
- ●Online remote control of multiple units
- ●External I/O connectors (BNC)
- ●Remote Control Unit RCU-42A (Option)
- ●Built-in backup batteries
- ●Time synchronized measurement (option)
- ●Distributed arrangement by EDX Sync Extension Unit is possible. (Refer to page 3-66)

EDX-3000B is an advanced stationary measuring instrument having sophisticated features and high-speed processing capabilities.
It is the highest-end model of EDX Series. Max input channels is 64, and max sampling frequency is 200 kHz for 32 channels in sync. It is possible to simultaneous record data and video as well as rosette analysis and other arithmetic operations.
Both on-line or off-line control is available, and with an optional display and keyboard, it can be used as an all-in-one data logger.

●Conditioner Cards (Refer to page 3-73)

Strain/Voltage Measurement Card	CDV-40B/40B-F
Dynamic Strain Measurement Card	DPM-42B
	DPM-42B-F
	DPM-42B-I
	DPM-42B-I-F
Thermocouple Card	CTA-40A
F/V Converter Card	CFV-40A
Charge Amplifier Card	CCA-40A/40A-F
CAN Card	CAN-40A/41A
Strain/Voltage Measurement Isolation Card	CDV-44AS
Constant Current Amplifier Card	CDA-44AS/45AS
Strain/Voltage/Acceleration Measurement Card	CVM-41A
A/D Converter Cards	AD-40AS/40AS-F

Hardware Specifications

Models	EDX-3000B-HE: Hard disk drive (HDD) 300 GB
	EDX-3000B-SE: Solid state drive (SSD) 30 GB
Conditioner Cards	CDV-40B(-F), CVM-41A, DPM-42A(-F), DPM-42A-I(-F),
	CTA-40A, CFV-40A, CCA-40A(-F), CAN-40A/41A,
	CDV-44AS, CDA-44AS/45AS, AD-40AS
Input Channels	Max. 64 (CDV-40B x 8)
Analog Input	See specs of respective conditioner cards for details.
Digital Input	32 bits (TTL level, contact input)
Voice Input	1 channel (Voice memo entered during recording
	can be saved with measurement bits data,
	using an optional Remote Control Unit RCU-42 A)
Sampling Methods	Synchronous sampling of all channels
Sampling Frequencies	
1-2-5 series	
1 Hz to 200 kHz for up to 32-channel data acquisition	
1 Hz to 100 kHz for up to 64-channel data acquisition	
1 Hz to 10 kHz for real-time synchronous data processing or	
CAN data measurement	
2^n series	
2 Hz to 131072 Hz for up to 32-channel data acquisition	
2 Hz to 65536 Hz for up to 64-channel data acquisition	
2 Hz to 8192 Hz for real-time synchronous data processing or	
CAN data measurement	
Display	Channel status LED (OVER value can be specified for each channel)
	REC/PAUSE LED
	OEL display for various status display (20 char. x 2 lines)
Operation Keys	REC, STOP, BAL, OPT., UP, DOWN keys on the front
External Control Connectors	CONT IN, CONT OUT (Remote control
	synchronous operation)
External I/O Connectors	External trigger TRG IN, TRG OUT
	External clock CLK IN, CLK OUT
	(Output at any frequency division ratio)
	Operation status output READY
External Interfaces	Mini DIN 6-pin for keyboard
	Mini DIN 6-pin for mouse
	15-pin VGA connector for external display
	USB 2.0 ports, 2 on the front and 6 on the rear
	LAN port 10/100/1000BASE-T
Power Supply	100 to 240 VAC
	Built-in batteries for instantaneous power failure
Current Consumption	2.0 A (For 100 VAC, CDV-40A/B x 8)
Operating Temperature Range	0 to 40°C
Operating Humidity Range	20 to 80% RH (Non-condensing)
Storage Temperature Range	-20°C to 60°C
Vibration Resistance	49.0 m/s² (5 G), 5 to 55 Hz (When not operating)
	29.4 m/s² (3 G), 5 to 55 Hz (When operating)
	EDX-3000B-HE: 9.8 m/s² (1 G), 10 to 200 Hz (When operating)
	EDX-3000B-SE: 19.6 m/s² (2 G), 10 to 200 Hz (When operating)
Shock resistance	196.1 m/s² (20 G)/11 ms
Dimensions	440(W)×186(H)× 341(D) mm (Excluding protrusions)
Weight	Approx. 13.8 kg (mainframe only)

Standard Accessories Power cable P-18 (With 2-pin conversion adapter CM-39)
Ground wire P-72, simplified instruction manual, instruction manual (CD-R) , and EDX accessory bag

Optional Accessories Conversion cable, synchronous cable, GPS receiver, antenna, Synchronous extension unit ESYN-30A, synchronous extension terminal, high-speed camera, detachable 15-in LCD EMON-30A, Keyboard, Mouse, and remote control unit RCU-42A

●Software Specifications A monitor, mouse and keyboard are required for setting, monitoring and data reproduction.

■Measuring Condition Setting

Measuring Channel Conditions
Measurement ON/OFF, measuring modes, range, HPF, LPF, balance ON/OFF, CAL range, CAL ON/OFF, calibration coefficient, offset, unit, channel name, measuring range, rated capacity, rated output, numeric display digits (any display items can be selected)

Number of Recordable Data Items
Up to remaining disk space of built-in memory
(Sampling frequencies 1 to 10kHz) 2 to 2 billion ($2x10^9$)
data items (Sampling frequencies 10001 Hz to 200 kHz)
AD data: 2 to 2 billion (Used as 16 bits)
2 to 1 billion (Used as 24 bits)

Manual Measurement Recording from REC to STOP, or designated number of data items from REC

Interval Measurement Automatic recording according to designated starting time and recording interval

Trigger Measurement Recording starts and stops according to designated trigger conditions.
Common trigger conditions
End trigger: Settable
Delay amount: Max. 4194304 points per channel for both start and end
Delay amount depends on the sampling frequencies and number of measuring channels.
Analog trigger conditions
Trigger channel: Any 1 channel
Trigger level: An engineering value
Trigger slope: Up, down
Digital trigger conditions
Trigger bit: Any 1 bit
Trigger level: 0, 1
External trigger conditions
Trigger slope: Up, down
Complex trigger conditions
Trigger source: Selection of Any 4 analog/digital channels, an external trigger channel, or a manual trigger channel
AND/OR: AND/OR can be used for analog trigger, digital trigger and external trigger.
Trigger level: An engineering value is set for the analog channel, and 0 or 1 for the digital channel.
Trigger slope: Up, down

TEDS Information Reading sensor's information and setting to channel condition automatically

■Measuring Operations

Monitor measurement, recording start, pause, stop balancing, CAL output, etc.

Real-time Processing
Monitoring and recording of data can be done synchronously.
The sampling ffrequencies up to 10 kHz are available.

●Video data acquisition with a web camera
Camera DirectX compatible Web camera (Recognized by the OS as an image device)
Number of Cameras 1
Resolution Max. 640 x 480
Frame Rate Max. 30 fps
Saving File Format AVI format
Resolution and frame rate depend on the camera.
The Web camera is optional.
Measuring Conditions During Recording
Manual mode, manual mode (Data points preset)

●Arithmetic Processing
Filter Processing
Applicable channels: Measuring channels (Analog)
Digital filter: IIR filter
Characteristics: Butterworth
HPF & LPF: One-half of the sampling frequency or less
Orders: 2nd to 4th
Differentiations/Integrations
Applicable channels: Measuring channels (Analog)
Orders: 1, 2
Moving Average
Applicable channels: Measuring channels (Analog)
Number of moving average data points: 2 to 5000

Arithmetic Operation
Number of calculation channels Max. 32
Calculation conditions ON/OFF, operators (max 200 characters), unit, numeric display digits, channel name (Max 40 characters), calculation zero, and calculation zero value

Applicable Operators and Constants
+,−,∗,/,^,《power》,PI[π],( ) [parentheses]
Function:

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	DSIN (Return value: Angle)	SSM	Max. shearing stress
DCOS	DCOS (Return value: Angle)	DEG	Principal strain direction
DTAN	DTAN (Return value: Angle)		

●FFT Analysis
Analysis Types Linear spectrum, power spectrum, cross spectrum, auto-correlation, and cross-correlation
Window Functions OFF, Hamming, Hanning, Fejer, Blackman, Gaussian
Number of Analysis Data 256, 512, 1024, 2048, 4096, and 8192
Number of Analysis Channels 4 channels/window, max. 8 windows
Saving File Format Kyowa standard file format (KS2)
KS2 file version: 01.04

■Monitor

Y-Time Graph X axis indicates the time, and Y axis the physical amount of measurement for a maximum of 16 channels. 1 to 10 graphs can be displayed on a window.
Y-Time (all channel) Graph X axis indicates the time, and Y axis the physical amount of measurement for all channels. The line color is the same for all channels.
Y-Time (DIV) Graph X axis indicates the time, and Y axis the physical amount of measurement for a maximum of 16 channels possible. Channel's zero position can be set on the Y axis.
X-Y Graph Any combination of 8 channels can be plotted on X and Y axis
Bar Graph Up to 32 channels are contained in a graph. 1 to 4 graphs can be indicated on a window. Peak hold ON/OFF
Digital Graph X axis indicates the time, and Y axis bit data of a digital channel (Up to 16 bits). 1 to 4 graphs can be displayed on a window.
Circle Meter Any one channel is displayed in a circle meter.
Bar Meter Any one channel is displayed in a horizontal or vertical bar meter.
Numeric Display Any one channel, 16 channels or all channels are listed. The max and min values of each channel can be displayed.
Over-input Indication Capable of displaying the excessive channel values in red
Graph Scale Capable displaying auto-scale value and full-scale value on the Y-Time graph (Y axis), X-Y graph (X, Y axes) and bar graph (Y axis). The Y-Time graph (Y axis) is able to change to 1 axis or 2 axes and CH.
Display Color Any color can be selected.
Title, labels Any title or X and Y axis labels can be specified.
No. of Windows 8 numeric windows, 8 graph windows (Including a confirmation window, Number of windows depends on the CPU, memory of the PC)
Auxiliary lines Capable of displaying the desired auxiliary lines on the Y-time Graphs (X axis and Y axis), X-Y Graphs (X axis and Y axis), and Bar Graphs (X axis and Y axis). (Up to 4 auxiliary lines each for both X axis and Y axis.)
Comparative Data Displays the comparative data (previous KS2 format file) on the Y-time graphs, excluding the Y-time (all channels) graphs and Y-time (DIV) graphs, and X-Y graphs for comparing the monitor data. The size of the data file is maximum 10 MB. If the file size exceeds 10 MB, the DCS-100A displays the 10 MB-data from its head.

■Data Reproduction

●Recorded Data Display
Graph Display 4 patterns of display condition can be set for a graph. Either of 1, 2, 4 graphs can be displayed
Y-Time graph: Up to 16 graphs per graph, and Y axis can be auto-scale.
X-Y graph: 1 graph fixed, Any 4 channels can be plotted on X- and Y-axis. Both axes can be auto-scale.

All Data Display All data can be displayed on a window at an interval of 4 channels.
Numeric Data Display Any 16 channels data can be displayed
Cursor Numeric display of the engineering value of cursor position.
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 Extracting of an arbitrary range or arbitrary channel from collected data file and conversion to a CSV format file possible. Data file titles, comments, channel conditions display and editing possible.
Max. and min. Display Showing max. and min. data of each channel (Max 5-data) , 400-data around the max. or min. can be shown in graphs.
KS2 File Block number support (1 block display, all block display) .
Displays and plays back the audio data possible.
Video Playback 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: ×0.1 to ×20.
Plays back the measured data, video and GPS data at the same time possible.
AVI Files Sets playback frame rate, start frame No. (time)
Static Measuring Files Reproduces the static measuring files (CSV format files).

●Data Analysis

Statistic Processing A list of maxima, minima, averages and standard deviations in a desired section of the data file. The results are saved in CSV files.

Arithmetic Operations

Inter-channel operations for up to 2 files. The result is saved in a new file (Up to 320 expressions can be specified).
Expression: Up to 200 characters

Applicable Operators and Constants

+,−,*,/,^《power》,PI[π],( ) [parentheses]
Function:

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	DSIN (Return value: Angle)	SSM	Max. shearing stress
DCOS	DCOS (Return value: Angle)	DEG	Principal strain direction
DTAN	DTAN (Return value: Angle)		

FFT Analysis

Analysis type: Linear spectrum, power spectrum, cross spectrum, auto-correlation, cross-correlation, coherence, transfer function
No. of analysis data: 256, 512, 1024, 2048, 4096, 8192, 16384, and 32768
Window functions: OFF, Hamming, Hanning, Fejer, Blackman, and Gaussian
Filters: 12 steps of 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000, 2000 Hz and FLAT
Integration times: 0 (None) to 2
Average times: 1 or more (0: whole waveform)
Shift data points: 2 or more

Analysis types	Analysis graph 1	Analysis graph 2
Linear spectrum	Amplitude (linear)/amplitude (log)	Phase
Power spectrum	Amplitude (linear)/amplitude (log)	N/A
Cross-spectrum	Amplitude (linear)/amplitude (log)	Phase
Auto-correlation	Correlation	N/A
Cross-correlation	Correlation	N/A
Coherence	Coherence	N/A
Transfer function	Amplitude (linear)/amplitude (log)	Phase

Analysis results are saved in CSV files. Y-Time graph display possible.

Histogram Analysis

Algorithm types
Peak/valley, maxima/minima, 1D rainflow, Amplitude, 1D time at level, 1D rainflow + peak/valley, 1D rainflow + maxima/minima, 2D rainflow
No. of slices:
1D algorithm: Even numbers from 10(±5) to 256(±128)
2D algorithm: Even numbers from 10 to 50
Slice width, hysteresis, offset (For maxima/minima), etc. can be specified.
Results: Tabular or drawing display (3D display for 2D rainflow)

Filtering Algorithm types (no delay and -6dB at the cutoff frequency)
HPF & LPF: FLAT to 500 k Hz (Effective up to one-half of the sampling frequency)
Mirroring
Analysis results can be saved as an additional format

Differentiation/ Integration

Differential/integration times 0 (None) to 2
Analysis results can be saved as additional format

●Utility

Multiple File Conversion Conversion to CVS, XLS, XLSX, or RPCIII format
File Coupling Multiple files (master and slave) acquired in synchronized operation can be coupled into one file.
Reverse Conversion Data files converted by this software into CSV format can be converted back to KS2 format.
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.
Overlap of Multiple Files Up to 16 data files can be displayed and overlapped as Y-time data.
Multiple File Conversion Converts multiple KS2 files acquired in the interval measurement into a CSV file.

■Configuration

Synchronous Operation Setting Standalone, synchronous master, synchronous slave
Recording Setting Set of data folders
Automatic File Conversion Automatic file conversion after measurement (CVS, XLS, XLSX, or or RPCIII format)
Engineering Unit Specification Up to three user specified engineering units can be registered.
Others Oscillator switching (internal, external), operation beep, balance standard, front speaker ON/OFF

■Print

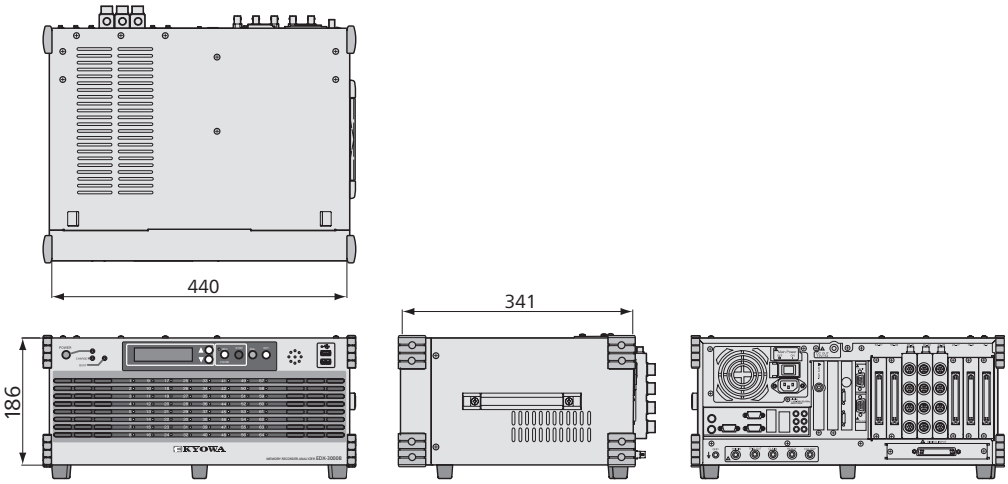
Printable Items Setting conditions, numeric data, graphs
Remark Optional printer driver is required.

●Remote Control Unit RCU-42A (Option)

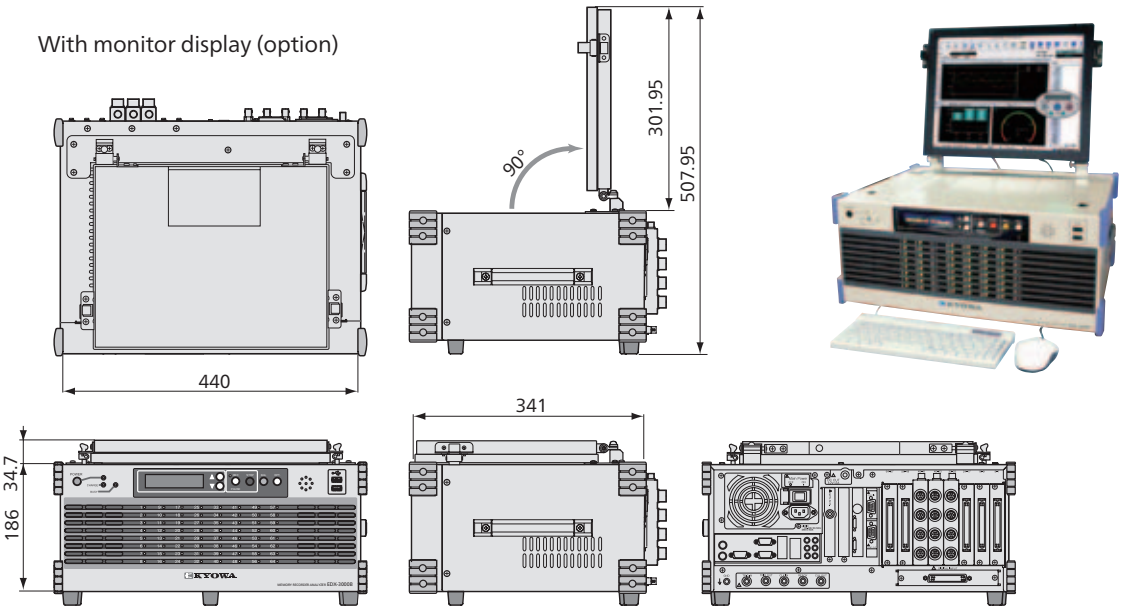
The front panel operation of the mainframe can be performed on this remote control unit. With a buzzer from the unit, an alarm sound can be clearly heard even though the sound from the mainframe is missed.

Control Functions	REC/PAUSE Starts/pauses data acquisition
	STOP Stops data acquisition
	BAL (balancing)
	OPT. (Optional function)
	VOICE MEMO (recording with the built-in microphone)
Indication	Recording, pausing and balancing are indicated with LED.
Cable Length	1.5 m

Dimensions



With monitor display (option)



EDX3000B Recommended products for combination

Data Analysis Software DAS-200A
→ 4-9