KYOWA

KYOWA ELECTRONIC □
INSTRUMENTS CO., LTD.

COMPACT RECORDER
EDS-400A

Compact Dynamic Strain Recorder
Entering the scene in advanced measurement of strain, vibration, pressure, load, etc.

COMPACT RECORDER New

EDS-400A

www.kyowa-ei.co.jp

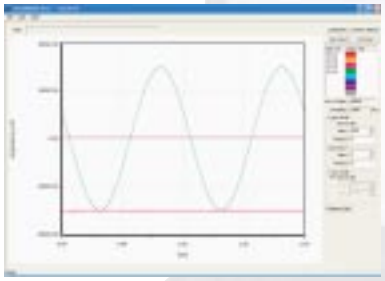
Signal conditioners and 16-bit A-D converters are incorporated, 4 channels each, into a compact package to perform advanced measurement in limited spaces.

The 4-channel EDS-400A is equipped with signal conditioners and 16-bit A-D converters to digitally record dynamic strain and voltage signals at high speeds. It can be set to desired recording conditions through either a PC connected to the LAN interface or a CF memory card inserted into the slot.
The recorder amplifies and digitizes input signals, and then saves the results in the CF memory card. The PC, if connected to the LAN interface, enables monitoring of waveforms of the data being recorded. The acquired data can be transferred to the PC either on-line via the LAN interface or off-line via the CF memory card. The accessory software enables the PC to graphically display the data while the optional DAS-100A or NI DIAdem analysis software enables data analysis in various modes on the PC.

COMPACT RECORDER

EDS-400A

Data is saved in CF card. LAN interface enables PC to control EDS-400A and to collect data.



Control Software
●EDS-40A

●General Specifications

Operating temperature range: 0 to 50 °C
Operating humidity range: 20 to 90 %RH (noncondensing)
Vibration resistance: 49.03 m/s² (5 G), 5 to 55 Hz (when operating)
Power source: 10 to 16 VDC; approx. 0.6 A (with 12 VDC supplied)
  Connector: Hirose RM12BRD-4PH
Storage temperature range: –10 to 60 °C
Operating environment: No dust and no inductive noise from large-capacity motor, etc.
Dimensions: 100 (W) x 50 (H) x 110 (D) mm (excluding protrusions)
Mass: Approx. 500 g

●Hardware Specifications

Number of measuring channels: 4
  Input connectors: Tajimi R05-R5F
  Applicable plugs: Tajimi R05-PB5M
Applicable sensors: Strain gages (4-gage system), strain-gage transducers, voltage-output sensors
Applicable bridge resistance: 120 to 1000 Ω (4-gage system)
Gage factor: 2.00 fixed
Excitation voltage: 2 VDC
Measuring range
  Strain: 6 steps of 1000, 2000, 5000, 10000, 20000 μm/m and OFF
  Voltage: 6 steps of 1, 2, 5, 10, 20 V and OFF
Accuracy: Within ±0.5 %FS
Balance adjustment (zero suppress): ON/OFF setting possible for each individual channel
  Adjusting method: True electronic method (saved in nonvolatile memory)
  Adjusting range
    Strain input: Resistance ±2 % (±10000 μm/m) or more
    Voltage input: ±10 V or more
Max. input voltage: ±30 V (for voltage measurement)
Frequency response range*: DC to 20 kHz (deviation: +1 dB, –3 dB)
Lowpass filter* *Characteristics of analog section
  Transmission characteristics: 2-pole (secondary) Butterworth
  Cutoff frequency: 20 Hz, 200 Hz, 2 kHz or FLAT
  Accuracy of cutoff frequency: –3 dB ±1 dB
  Attenuation characteristics: –12 dB ±1 dB/oct.
Resolution of A-D conversion: 16 bits
Sampling method: Simultaneous sampling of all channels
Sampling frequency: 1, 2, 5, 10, 20, 50, 100, 200, 500 Hz, 1, 2, 5, 10, 20, 50, 100 kHz (16 steps)
  Note: Selectable number of channels is 2 for sampling at 50 kHz, and 1 for sampling at 100 kHz.
Control switches: START/STOP, ZERO, READ
Condition setting: Through either PC or CF card in which necessary conditions are written in advance
Start/stop of recording: Through PC, panel key or external contact
Zero suppress execution: Through PC, panel key or external contact
LED annunciators
  POWER: Lights up when the power is ON.
  SYNC: Indicates synchronization status.
  MEAS: Lights up when recording is in progress.
  1, 2, 3, 4: Indicate channel status.
  READ: Indicates the status of measuring conditions.

Point 1

Minimal installation space required

Palm-sized compact design

Designed to be far smaller and lighter than KYOWA's forerunners, the 4-channel data logger can conveniently be carried for field tests and business trips.

Point 2

4 channels per unit

Applicable to strain and voltage measurement

Up to 8 units can be connected in cascade for 32-channel simultaneous measurement. Rear input connectors allow direct connection of sensors outputting strain and voltage signals.

Point 3

Sampling at a maximum 100 kHz

Well suited to strength tests and vibration/noise measurement

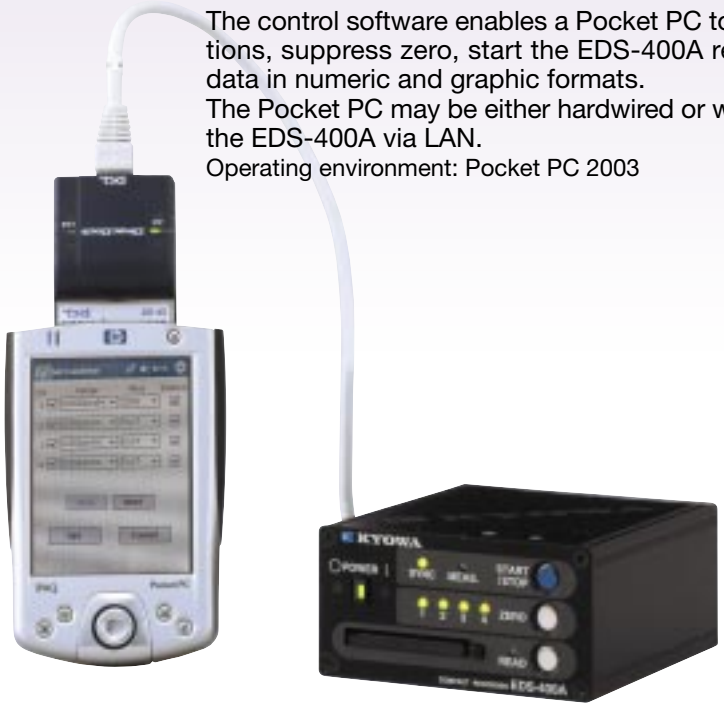
The maximum sampling frequency is 100 kHz for 1-channel measurement and 20 kHz for 4-channel simultaneous measurement. Thus, the EDS-400A can be utilized for various purposes including strength tests of car bodies and oil pressure measurement of engines and transmissions.

- Measured data is saved in CF card, enabling long-term measurement.

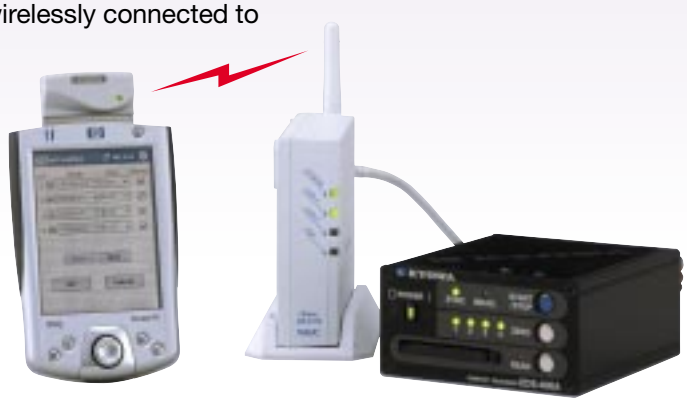
Options

Control Software for Pocket PC

The control software enables a Pocket PC to set measuring conditions, suppress zero, start the EDS-400A recording, and monitor data in numeric and graphic formats.
The Pocket PC may be either hardwired or wirelessly connected to the EDS-400A via LAN.
Operating environment: Pocket PC 2003



(Pocket PC, LAN interface card and LAN cable are not provided.)



(Pocket PC and telemetry LAN transmitter and receiver are not provided.)

Operation modes
- **Manual:** A press of the START/STOP key starts it recording. The EDS-400A stops recording when it completes recording in a preset number of measuring values or when the START/STOP key is pressed once again.
- **Trigger:** A press of the START/STOP key places the EDS-400A in standby condition and when the trigger condition is satisfied, it starts recording. The number of measuring values before the trigger point can be specified for recording.

Trigger functions
- **Trigger source:** External trigger signal, analog input
- **Trigger level:** Can be set only for the analog trigger mode, in a plus/minus full scale range.
- **Trigger slope:** Rise, fall or both to be specified
- **Number of pretrigger data:** Number of measuring values before trigger point can be specified for recording.

Backup function: Setting conditions, balance adjustment parameters
LAN interface: 10BASE-T/100BASE-TX
- **Connector:** RJ-45 modular jack

Monitor display: Waveforms, bar graphs and numeric data can be monitored on the PC connected via LAN port.
Data storage: CF memory card (128 MB to 1 GB)
Synchronized operation: Dedicated synchronization cable enables cascade connection of up to 8 units for synchronized recording. The units connected in cascade record concerned data in the respective CF cards as separate files, which can be arranged in a single file on the PC after collection.

●Control Software

Measuring condition setting functions
- **Sensors:** Strain gages, strain-gage transducers, voltage-output sensors
- **Number of measuring channels:** Max. 32 (with 8 units of EDS-400A connected in cascade)
- **Sampling frequency:** 1, 2, 5, 10, 20, 50, 100, 200, 500 Hz, 1, 2, 5, 10, 20, 50, 100 kHz
- **Measuring mode:** Manual, analog trigger, external trigger
- **Number of measuring values:** Selectable in a range of 0 to 4294967295 (depends on the blank space of CR card)
  Setting to 0 lets the EDS-400A record to the full capacity of CF card.

Measuring channel condition setting functions
- **Selection of measuring channels:** Possible
- **Range:** Selectable for each measuring channel
  Strain: 1000, 2000, 5000, 10000, 20000 μm/m or OFF
  Voltage: 1, 2, 5, 10, 20 V or OFF
- **Lowpass filter:** A cutoff frequency is selectable for each measuring channel from the following: FLAT (20 kHz), 2 kHz, 200 Hz and 20 Hz
- **Calibration coefficient:** A value by which every measured value is multiplied can be set for each measuring channel.
- **Offset:** An offset value which is added to every calibrated value can be set for each measuring channel.
- **Engineering unit:** Selectable from 60 kinds for each measuring channel. Input of an optional unit is also possible.
- **Channel name:** Can be input for reference.
- **Zero suppress:** ON/OFF setting possible for each measuring channel

Point 4

Suitable as onboard logger

Stand-alone operation possible

The EDS-400A operates on 10-16 VDC.

- START/STOP and ZERO buttons are provided on the front panel to enable start/stop of recording and zero suppress.

Point 5

Networked operation possible

LAN interface provided standard

A PC connected to the LAN interface can control the EDS-400A as well as monitor and collect measured data.

Point 6

Analysis software optionally available

DAS-100A or NI DIAdem

Collected data can be effectively and efficiently edited and analyzed using KYOWA's DAS-100A or the DIAdem software available from National Instruments.

Major functions of DAS-100A: •Cutting of necessary data section and editing •FFT analysis, histogram analysis, differentiation/integration •Arithmetic operations, filtering, statistical operations

■Protector Kit EDS-PMF

The protector kit is designed to not only protect the EDS-400A against shocks but also couple it with the ESB-04A battery box or join multiple units of the EDS-400A.

Shown above is the EDS-400A coupled with the ESB-04A battery box, using EDS-PMF protector kits.

Shown above are 2 units of the EDS-400A vertically coupled using EDS-PMF protector kits. Horizontal coupling is also possible.

■Bridge Connectors

Bridge connectors are required to connect strain gages to the EDS-400A.

- DB-120C-2R (right) (for 2-wire system)
- DB-120C-3R (left) (for 3-wire system)

Usable for 1-element 120Ω gages.

■Remote Control Unit

START/STOP, TRIGGER and ZERO buttons are provided to control the recorder from a distant location.

- RCU-04A

●Other Options

- ■Strain input conversion cable, 30 cm long
- ■Voltage input cable, 1.5 m long
- ■Synchronization cable, 20 cm long
- ■AC adapter (100-240 VAC)

■Thermocouple measuring unit
Enables the EDS-400A to measure temperature using a thermocouple.

■F-V converter
Converts pulse-input frequency to voltage for measurement with the EDS-400A.

Condition saving: Measuring conditions and measuring channel conditions can be saved in a condition file with a desired name. The saved condition file enables immediate setup for measurement with the same conditions as previous.

Graph display of monitoring data: Monitoring data can be graphed as wave forms or bar graphs.

Wave form graph: Monitoring data are graphed with the number of the data on X axis. The number can be set up to 1200, and a maximum 8 channels of data can be graphed with numeric values on the same display.

Bar graph: Monitoring data of up to 8 channels are graphed with the channels on X axis. Numeric values are simultaneously displayed.

Real-time graph: Recording data of up to 8 channels are graphed with the number of the data on X axis. Numeric values are simultaneously displayed.

Measuring mode: Manual, analog trigger, external trigger

Manual: A press of the START/STOP key starts the EDS-400A recording measured values in a preset number. If a PC is connected, sampling at 10 kHz or less enables the PC to perform real-time data collection.

Analog trigger: When a preset trigger level is reached in the designated channel, the EDS-400A starts recording measured values in a preset number.

External trigger: An external trigger signal starts the EDS-400A recording measured values in a preset number.

Data reproduction: Recorded data can be displayed in graphic format or converted to CSV format.

Wave form graph: Data of up to 8 channels can be graphed as wave forms.

Conversion to CSV format: A desired data section can be cut for saving in CSV format.

Types of files

Measuring condition file: Saved with an extension of E4C

Measured data file: KYOWA standard format (extension: KS2)

●Operating Environment (PC)

CPU: Pentium III 700 MHz or higher, or the equivalent
OS: Windows 2000 (Professional)/XP (Professional, Home Edition)
Memory: 256 MB or more
Interface: 10BASE-T/100BASE-TX
Hard disk: Blank space of 10 MB or more (for other than storage of measured data)
Display: 1024 x 768 dots or more: full color
CD-ROM drive: For installing the control software, etc.

●Standard Accessories

DC power cable P-57, 128MB CF memory card, CD-R (control software EDS-40A and instruction manual)

Protector kit firmly guards the mainframe as well as facilitates connection of multiple units.

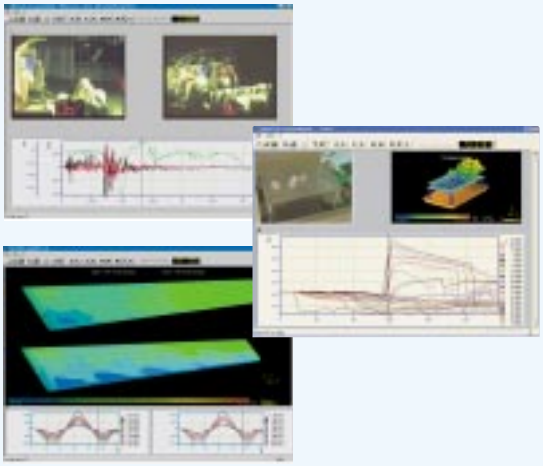
Protector Kit Mounted on Mainframe

●Protector Kit EDS-PMF

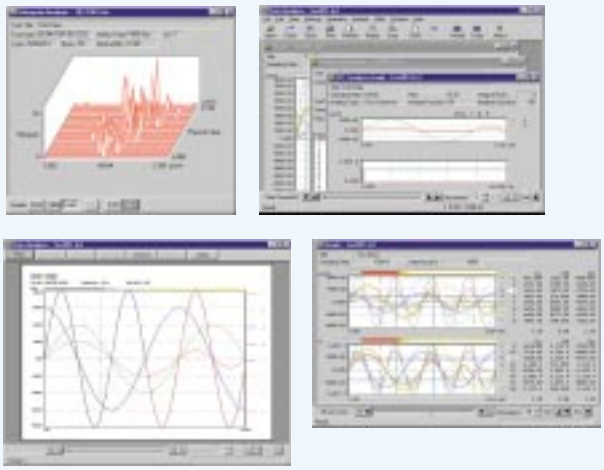
In combination with various sensors for automotive performance tests, safety confirmation and evaluation of riding comfort, the EDS-400A enables measurement and analysis of physical quantities such as acceleration, load, component force, moment and oil pressure.

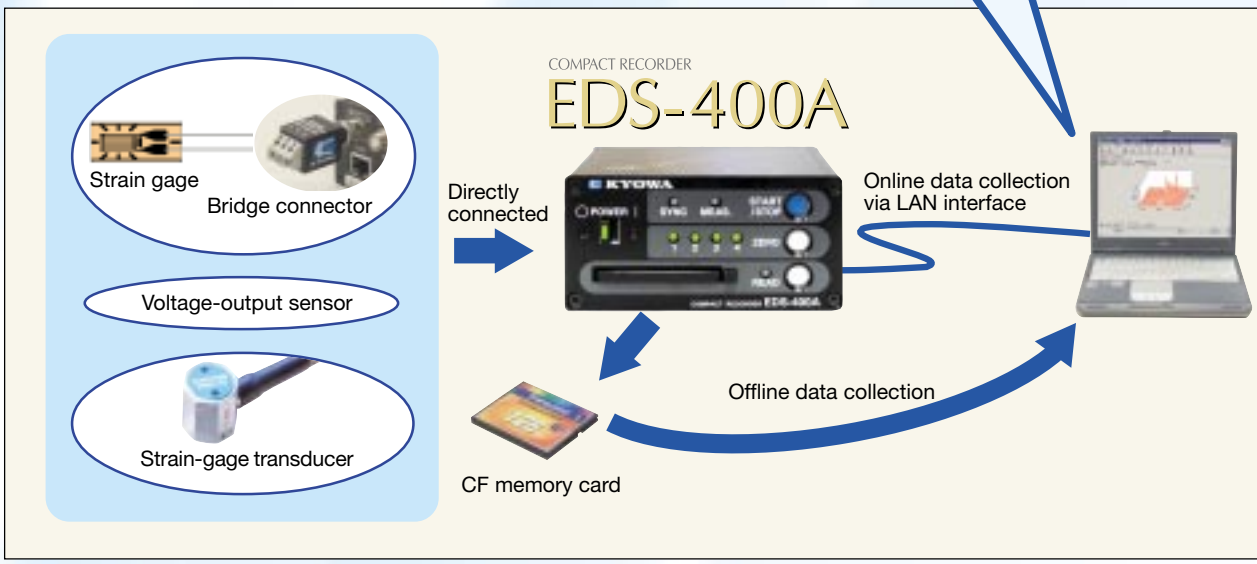
Examples of test results obtained by analysis software options

NI DIAdem™

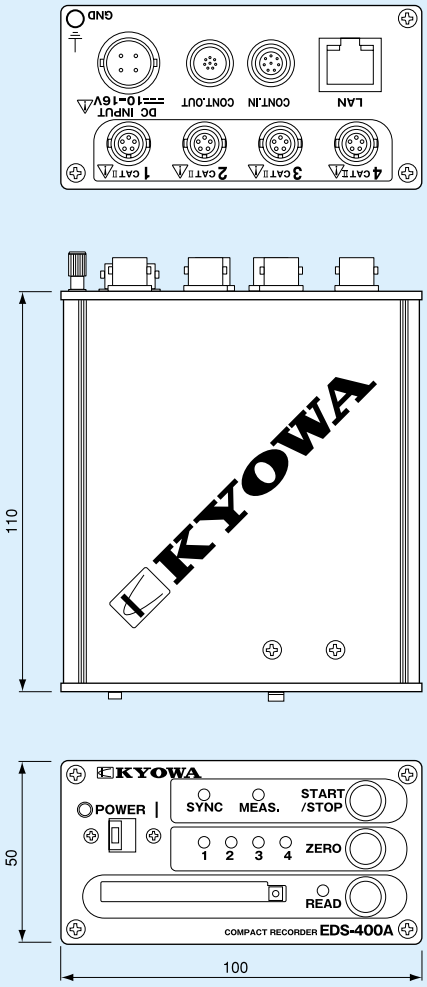


DAS-100A





Dimensions



Data Acquisition Time for Reference with 128MB CF Card (Standard Accessory)

Sampling Frequency	Number of Measuring Channels			
	1	2	3	4
100 kHz	8 min.			
50 kHz	16 min.	8 min.		
20 kHz	40 min.	20 min.	13 min.	10 min.
10 kHz	80 min.	40 min.	26 min.	20 min.
5 kHz	160 min.	80 min.	53 min.	40 min.
2 kHz	6.6 hr.	3.3 hr.	133 min.	100 min.
1 kHz	13 hr.	6.6 hr.	4.4 hr.	3.3 hr.
500 Hz	26 hr.	13 hr.	8.8 hr.	6.6 hr.
200 Hz	2.7 days	33 hr.	22 hr.	16 hr.
100 Hz	5.5 days	2.7 days	44 hr.	33 hr.
50 Hz	11 days	5.5 days	3.7 days	2.7 days
20 Hz	27 days	13 days	9.2 days	6.9 days
10 Hz	55 days	27 days	18 days	13 days
5 Hz	111 days	55 days	37 days	27 days
2 Hz	277 days	138 days	92 days	69 days
1 Hz	555 days	277 days	185 days	138 days

Specifications are subject to change without notice for improvement.

Safety precautions Be sure to observe the safety precautions given in the instruction manual, in order to ensure correct and safe operation.

Reliability through integration

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Cat. No. 604B-U34
Printed in Japan on Recycled Paper 9/04 ocs