

TML

TML Pam E-440A

USB mode/4-channel

*Smart Dynamic
Strain Recorder*

DC-104R

On-vehicle measurement

Miniature

frequency response DC - 1kHz

measuring Strain

measuring DC-Voltage



USB available

DADiSP conformable

16-bit ADC

DC Battery drive

128-MByte max.
Compact Flash Memory

Compact flash memory card



Tokyo Sokki Kenkyujo Co., Ltd.

Small, all-in-one dynamic strain recorder suitable for on-vehicle measurement

Smart Dynamic Strain Recorder

DC-104R



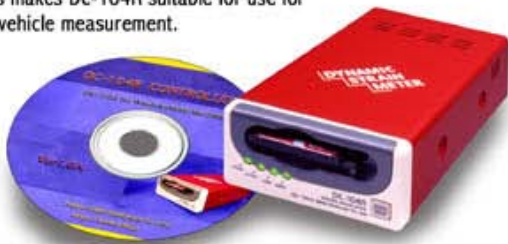
Compact Flash Memory Card
Capacity: 32/64/128MByte
- one designated by our company

The DC-104R is a dynamic strain recorder featuring an ultra-small size and on-vehicle measurement. It has a 4-channel configuration and is as small as post-card and extraordinarily lightweight. It is an all-in-one dynamic strain recorder with a 16-bit high-resolution ADC, a high sampling rate of 50 microseconds per channel, and a USB port. Data can be recorded on-line using a USB port. Data can also be recorded off-line using a compact flash™ memory card of 32 64 or 128MB in storage capacity (one designated by our company). The Controller DC-7104, a software program that comes standard with this recorder, allows a user to perform all steps of dynamic strain measurement on a Windows™ PC, from the calibration of the recorder prior to measurement to the editing of collected data. It also allows a user to store data in the DADiSP/2000 format for data analysis.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Compact flash is a trademark of San Disk Corporation. DADiSP is a registered trademark of DSP Development Corporation in the United States.

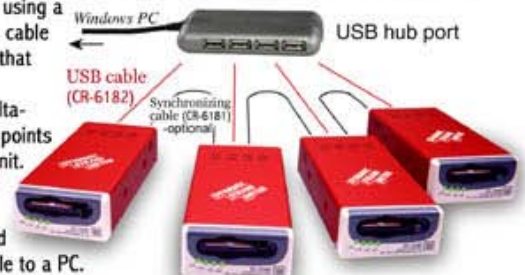
Miniature

It has a footprint of 8.4cm X 15.7cm, which is comparable to the size of a postcard, and it also is low in height, 4.2cm. This makes DC-104R suitable for use for on-vehicle measurement.



Max. 32 channels using 8 units

One unit has a 4-channel configuration. Because eight units can be connected in parallel, a maximum of 32 channels can be used. All units can be connected using a synchronizing cable (optional) so that data can be sampled simultaneously at all points set on each unit. Data sampled this way can be transferred via a USB cable to a PC.



Memory card of 32, 64 or 128MB

A compact flash memory card (one designated by our company) records data at the speed of 50 microseconds per channel max. (you can achieve this speed only when using one channel.) This card of 32, 64 or 128MB in storage capacity can be plugged into or unplugged from the recorder and no adapter is required. The recording format complies with the DADiSP/2000.



Compact flash is a trademark of San Disk Corporation.

Sampling speeds and recording time

Sampling speeds are 50 microseconds per channel maximum if only one channel is used. If a compact flash memory card (one designated by our company) is used, data can be stored with the same sampling speeds. Sampling speeds are shown below relative to measuring time. Also, how many hours or days each card can be used are shown below.

	1ch	2ch	4ch
50 μs	41 min.	—	—
100 μs	83 min.	41 min.	—
200 μs	167 min.	83 min.	41 min.
500 μs	6.9 hrs.	3.4 hrs.	1.7 hrs.
1ms	13.9 hrs.	6.9 hrs.	3.4 hrs.
2ms	27.9 hrs.	13.9 hrs.	6.9 hrs.
5ms	69.9 hrs.	34.9 hrs.	17.4 hrs.
10ms	139.8 hrs.	64.4 hrs.	32.2 hrs.
20ms	11.6 days	5.8 days	2.9 days
50ms	29.1 days	14.5 days	7.2 days
100ms	58.2 days	29.1 days	14.5 days

Users' memory

48M words with a 128MB card
24M words with a 64MB card
12M words with a 32MB card

NB: The above results assume that a 128MB card is used.

DADiSP/2000

Data obtained by measurement can be stored in CSV format and other formats that conform to the DADiSP/2000, a software program for analyzing data on dynamic phenomena. A user can store data in CSV or BIN format by using the Controller DC-7104, a software program that comes standard with the recorder.

DADiSP/2000 is available as a separate software package. For more detail, please contact DSP Development Corporation in the USA. [URL: <http://www.dadisp.com>]

DADiSP is a registered trademark of DSP Development Corporation in the USA.

USB - Universal Serial Bus

Because the recorder DC-104R is compatible with the USB, it is not necessary to restart a computer or to set a terminator or ID number after a USB cable is connected. Using a personal computer with the software DC-7104 installed, you can enter measurement conditions while communicating with the unit via a USB line.


To start or stop measurement, the operator needs only to press the start/stop button on the unit.



NOMENCLATURE

Top

Compact Flash Memory card
Designated card is required.
Available upto 128MByte storage capacity



Status LED
MES Proceeding to measurement
USB Communicating via USB cable
SYNC Synchronizing in multiple
PWR Power being ON
While balancing, all LED are blinking.

START/STOP
To start or stop measurement

BALANCE mode
By depressing the key 3 seconds or more
Balancing functions for the model itself.


Back

USB port
USB cable CR-6182 is used for setup of measurement and for transfer of data to a PC.

CONTROL
For multiple use, synchronizing cable CR-6181 optional is used.

POWER
DC-battery drive
Power cable CR-1310 is used for connection with a DC battery.

CH1 - CH4
Sensor cable CR-6180 is used for connection with versatile strain gauges and transducers.

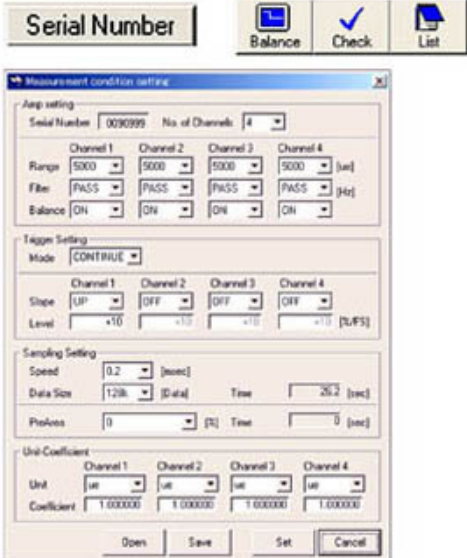


SYSTEMATIC DIAGRAM



CONTROLLER DC-7104

• Measurement setup



Serial Number

Balance Check List

Measurement condition setting

Serial Number: 000999 No. of Channels: 4

Channel	1	2	3	4
Range	5000	5000	5000	5000 (μV)
Filter	PASS	PASS	PASS	PASS (Hz)
Balance	ON	ON	ON	ON

Tagout Setting: Mode: CONTRIBUTE

Channel	1	2	3	4
Slope	UP	OFF	OFF	OFF
Level	+10	+10	+10	+10 (μFS)

Sampling Setting: Speed: 0.2 (ms) Data Size: 128k (Data) Time: 26.2 (sec) Process: 0 (%) Time: 0 (sec)

Unit Coefficient:

Channel	1	2	3	4
Unit	μV	μV	μV	μV
Coefficient	1.00000	1.00000	1.00000	1.00000


Open Save Set Cancel

• Monitoring



Number Wave X-Y

• Data saving



Save Bin Save Csv

Data Analysis Software DADISP/2000

Versatile analysis such as Fourier transform and spectral analysis of the measured data is available on Windows™ PC. Contact web site www.dadisp.com for the detail.

MS-EXCEL
Arrangement of data and formulas in a spreadsheet.



Compact Flash Memory-card (one designated by us) - conformed to DADISP/2000

CompactFlash™ Card
32 MB
64 MB
128 MB

SPECIFICATIONS

SMART DYNAMIC STRAIN RECORDER DC-104R

Measurement

Measuring points	4
Inputs	Strain(in normal), Voltage (Optional)
Gauge resistance	120Ω, 350Ω (Full bridge)
Bridge excitation	2V DC
Measuring range	5000, 10000, 20000×10 ⁻⁶ strain in 3 ranges
Maximum range	±20000×10 ⁻⁶ strain
Accuracy	±0.2%FS
Low pass filter	30, 100, 300Hz, PASS (amplitude flat)
Cut-off frequency	
Frequency response	DC~1kHz (-3dB±1dB)
Stability on Zero	±1×10 ⁻⁶ strain/°C with maximum sensitivity
on Span	±0.01%/°C with maximum sensitivity
Balancing method	Electronics
Balancing range	±10000×10 ⁻⁶ strain
Balancing accuracy	±0.06%FS
Balancing speed	Approx. 1 sec./CH
A/D converter	16-bit Successive approximation (14-bit output)
Resolution	5000×10 ⁻⁶ strain range 1×10 ⁻⁶ strain div. 10000×10 ⁻⁶ strain range 2×10 ⁻⁶ strain div. 20000×10 ⁻⁶ strain range 4×10 ⁻⁶ strain div.
Sampling	Simultaneous sampling
Fastest sampling	50μsec/1ch, 100μsec/2ch, 200μsec/4ch

Functions

START/STOP	Panel key operation, External signal, Computer operation available
MANUAL TRIGGER	External signals, Computer operation available
BALANCE, OPEN CHECK	Computer operation available
NB :	Full channel available simultaneously Balancing available by depressing START/STOP key 3 seconds or more

LED status Power, Synchronization, USB, Measurement

Setup

Procedure	USB communication by standard software
Channels	1, 2, 4 channel mode
TRIGGER Mode	SINGLE, CONTINUE, FREERUN
Level	1-100% with 1% division for full scale
Slope	UP, DOWN
Frequency	200 times max. NB: It may change due to file size

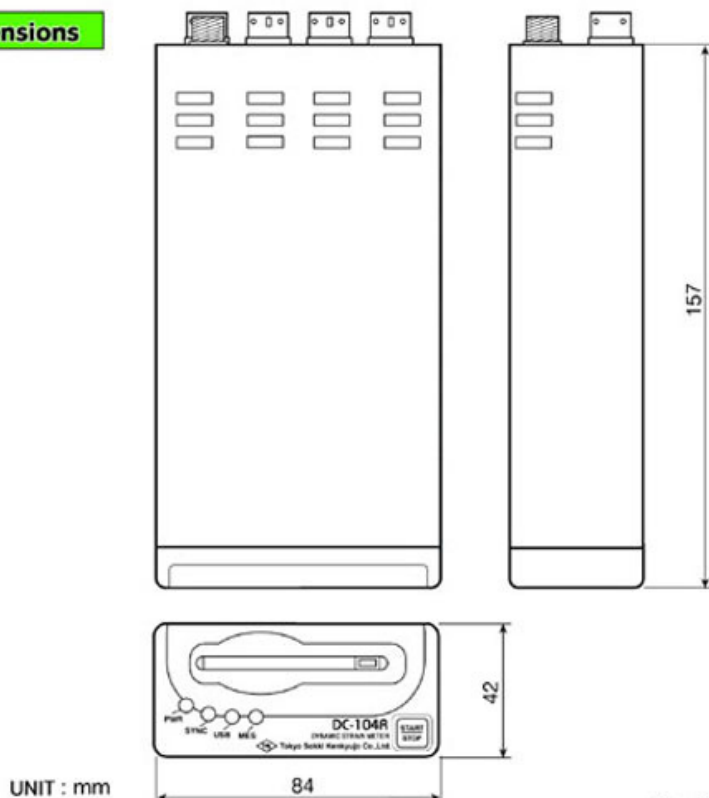
Data save

Saving media	Compact Flash™ memory card 128MB capacity max. 32MB card standard
Format	Conform to DADISP/2000
Saving speed (Sampling intervals)	50μs ^{*1} , 100μs ^{*2} , 200μs, 500μs, 1ms, 2ms, 5ms, 10ms, 20ms, 50ms, 100ms ^{*1} in 1-ch use only ^{*2} in 1 or 2 channel use Other with upto 4 channels
Data size	1k, 2k, 4k, 8k, 16k, 32k, 64k, 128k, 256k, 512k, 1M, 2M, 3M, 4M, 6M, 8M, 12M, 16M ^{*1} , 24M ^{*1} , 32M ^{*2} , 48M ^{*2} word It is changeable by 10% division for 0-100% of pre-area, while 256k word(1-ch) is at maximum. ^{*1} in 1-ch use only ^{*2} in 1 or 2 channel use Other with upto 4 channels

General specs.

Power source	10~16V DC
Environment	0~+50°C 85%RH or less (no condensation)
Vibration tolerance	20m/s ² (50Hz 0.6mm-p-p) in 3 directions
Power consumption	3.5VA max.
Dimension	84(W)×42(H)×157(D)mm
Weight	Approx. 500 gr.

Dimensions



Standard accessory

DC power cable CR-1310	----- 1
Sensor cable CR-6180	----- 4
USB cable CR-6182	----- 1
Compact Flash™ Memory card (32MB capacity)	----- 1
Measuring software(CD-ROM)-----	1
Controller DC-7104	
Operation manual	-----1

OPTIONS

Synchronizing cable CR-6181
AC adaptor set CR-1860
Attenuation cable CR-4010
External control cable CR-6183
Bridge Box for strain gauging

Specifications subject to change without prior notice.

ISO9001



Approval Certificate No.: 957261
Design and manufacture of strain measuring equipment
Manufacture of Transducers
No.2 and No.3 Production Divisions
(Tokyo Head Office and Kiryu Factory)



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