CF-7200

Portable 2-channel
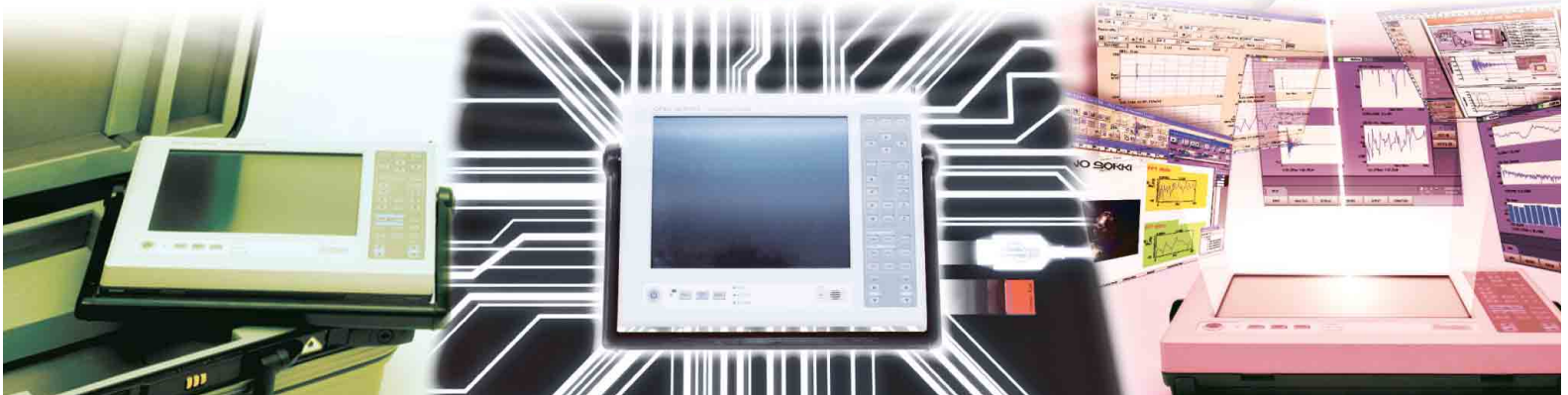
FFT Analyzer

CF-7200

Lightweight, compact and highly portable
The de facto standard for the next generation,
for worldwide use

Portable Size Multi interface Direct Operation

ONO SOKKI

CF-7200

Multi

Flexible Data Sharing

Accepts USB, Compact Flash Card, and other general-purpose interfaces for compatibility with PCs and easy data sharing in the existing environment.

Intuitive Button and Touch-panel Operations

The CF-7200 needs no mouse - simply press buttons for all operations. The click-feel buttons and touch panel allow immediate operations ranging from start/stop of analysis to display of basic functions.

An Advanced FFT Analyzer Covering Sophisticated Needs on Site

The CF-7200 Has Arrived

In this easy-to-use FFT analyzer designed for modern needs, all aspects of the CF Series have been upgraded. With improved PC compatibility and a much smaller size of the main body, the CF-7200 delivers quick and easy measurement and analysis, yet with exceptionally high accuracy. Integrating all on-site needs into its compact body, the CF-7200 is a multi-functional high-performance analyzer that will become the de facto standard for the next generation.

Interface

Direct Operation

Portable Size

Lightweight, Compact and Highly Portable for All Sites

No setup needed before measurement or troublesome installation on site, such as connecting a personal computer, cables, and power supply to a measuring instrument.
All functions necessary for measuring and analyzing noise and vibration are built into the CF-7200's small file size, for greater flexibility on all sites.
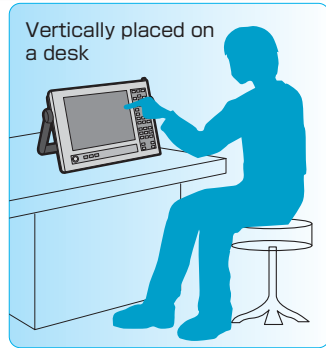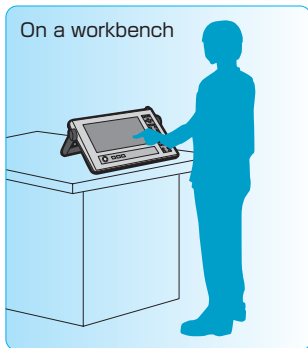
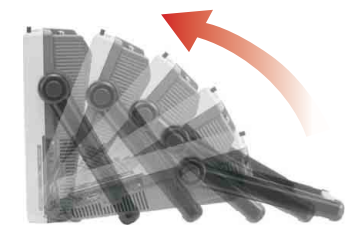# High On-site Flexibility Sets a New Standard for FFT Analyzers

All Field-oriented Functions Integrated into Small File Size

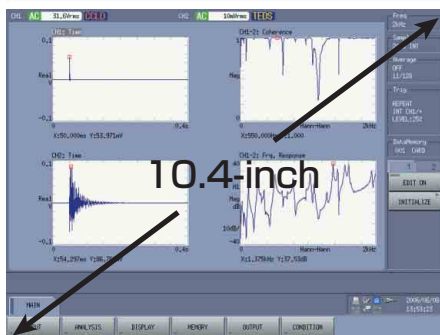## 1 Flexible Placement for Good Visibility

On a workbench

Vertically placed on a desk

Horizontally placed on a floor

360-degree rotary handle for setting at any angle

---

2 Highly Legible Large Screen with Easy Input

10.4-inch

Thanks to the 10.4-inch TFT liquid crystal display, detailed data can be displayed even though QUAD display mode is selected. Simple and easy operation is also possible by touch panel.

3 Data Management by Entering Memos Directly
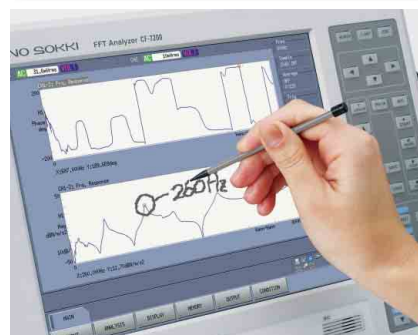
With the supplied stylus pen, comments, marks and memos can be entered directly, making it easier to recognize the working efficiency and data. Memos can be saved simultaneously and be shown or hidden.

4 Intuitive Button Operations

Selection of main data of the FFT analyzer, selection of the input voltage range and frequency range, and saving and loading of data can be performed directly from the hardware keys on the front panel. The CF-7200 offers simple, quick operations and much more. Even when observing a signal with unknown magnitude and frequency, an appropriate range and display conditions can be set with intuitive continuous button operations. And the signal output function can be turned on or off with the hardware keys, so signal output* can be started or stopped with a simple ON/OFF, preventing careless operations.
(* Option)

5 Voice Memos Attached to Data

Equipped with a built-in microphone for voice recording and a speaker, voice memos can be attached to data and played back when the data is displayed, supporting data arrangements. There are also connectors for connecting an external speaker and microphone, allowing you to create voice memos even in a noisy place.

Input and Output Connectors Conveniently Arranged on Top

6 Automatic Sensor Data Input with TEDS

Each channel is equipped with a CCLD (power supply for sensors) which can directly drive an acceleration pickup, a microphone, and other sensors requiring a power supply. TEDS reads data retained in a TEDS sensor and then automatically supplies the power to the sensor and performs unit calibration.

**TEDS
CCLD**

* TEDS
TEDS, an abbreviation for Transducer Electronic Data Sheet, is an information description format for sensor-specific information, prescribed by the IEEE1451 Series. When TEDS data is implemented in a sensor, the sensor has a function called "plug-and-play sensor" which allows sensor data (sensitivity, weight, etc.) to be transmitted and recognized by a measuring instrument connected. As a result, troublesome unit calibration, which can easily lead to errors, can be performed automatically.

* CCLD
CCLD, an abbreviation for Constant Current Line Drive, is a method for driving a constant-current type preamplifier incorporated in a sensor. Either an acceleration sensor or microphone with a built-in preamplifier can be driven by connecting it to a signal input terminal.

7 Direct Driving of Rotation Detector

Equipped with dedicated connectors which directly drive a rotation detectors[1] and can be used as an external sampling clock. This makes it easy to perform order ratio analysis[2] which analyzes vibration and noise of engines, motors, and other rotating machinery with rotation-based values.

[1] Applicable to the MP-981 /LG-916.
[2] under development

8 Cable Disconnection Detecting Function

Automatically detects cable disconnection of an acceleration pickup and a microphone*, preventing trouble before measurement.
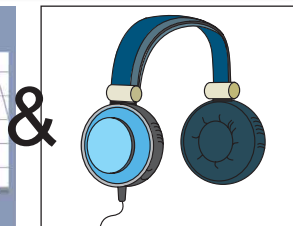
* Intended for sensors with a built-in constant-current type preamplifier.

Panel for rack mounting (for special orders)
Ono Sokki offers a panel which enables the CF-7200 to be rack-mounted.

9 Visual and Aural Check of Phenomena

&
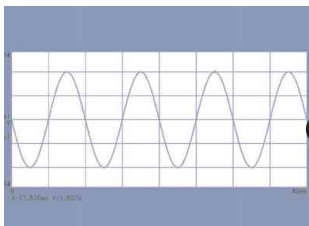
A raw signal coming from an acoustic or vibration sensor connected to each channel can directly be monitored as sound using a headphone or an external speaker. This makes it possible to check aurally whether an intended vibration or sound is input correctly as well as by waveform observation, allowing you to check sensor setup and operation intuitively and with your senses.

Meticulously Designed for Easy Operation on Site
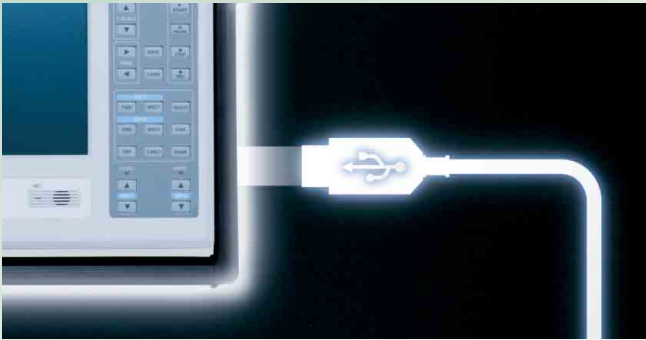
Smooth Operations on a Desk

USB Mass-storage Function with Direct PC Connection

The USB mass-storage function makes it possible to transfer data of the CF-7200 to a PC through a USB cable* without having to remove a storage medium and without needing special software (Windows ®XP).

* USB connector mini-B type

Accepts Large-capacity CF Cards

Data can be recorded in a high-speed 2GB CF card (compact flash memory card*), enabling long-time recording of a large volume of data.

* Recommended by Ono Sokki.

Data Recording Function

The data recording function for recording a signal waveform in the CF-7200 at a touch of the REC button makes it possible to record long-time phenomena, which are difficult to be caught timely and the like in a memory card*. The recorded data can then be reproduced and analyzed on the CF-7200 at a later time and place. Data can also be analyzed using PC-based sound and vibration analysis software.

* Recording format: ORF (Onosokki Record Format)

CF card capacity (bytes)	512M	1G	2G
Recording time (approx.)	8 minutes	16 minutes	33 minutes*

2-channel, 100kHz-range, data only
*Maximum record time at single time

Saving Data Simultaneously in Various Data Formats

The DAT format (binary), TXT format and BMP format can also be saved simultaneously. Data can also be processed using Office software and pasted into reports. Since the underlying data in DAT format are securely saved, data can be displayed and processed using PC-based FFT software (DS-2000 Series, XN-8000 Series) and the CF unit.

Diverse Data Processing on a Desk
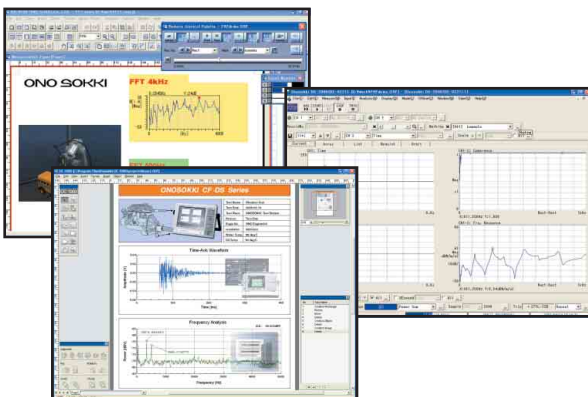
Data recorded by the CF-7200 can be reproduced and analyzed by various sound and vibration analysis software on a Windows®- based PC.

* See page 11 for details.

Outdoor noise analysis using the CF-7200 and an LA Series Sound Level Meter

Highly Portable Analyzer for Use Anywhere

Weighs just 3.5kg

The main unit of the CF-7200 weighs about 3.5kg*, thanks to the simple and compact body for high portability.
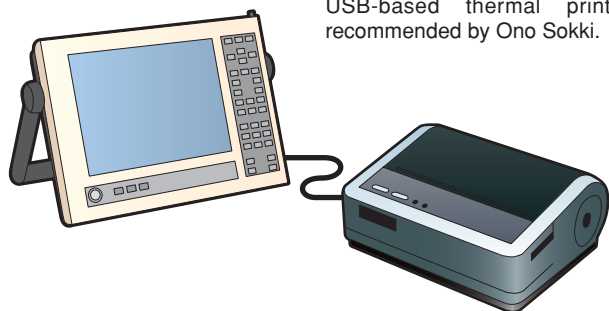
* Excluding battery pack

4-hour Battery Operation

By using the detachable lithium rechargeable battery, the unit can run continuously for about 4 hours*. Measurement can be performed freely, even outdoors or where no power supply.

* Without signal output, at 25℃ ambient temperature

Printing Function

Display data can be printed to a USB-based thermal printer recommended by Ono Sokki.

Remote Control

When the remote controller* (DS-0295) is connected to the CF-7200, three main operations can be performed in addition to analysis start/stop. Operating the CF-7200 from near the working or supervising position makes measurement much easier.

* Option

State-of-the-art Technologies and High Specifications, All in a Compact Body
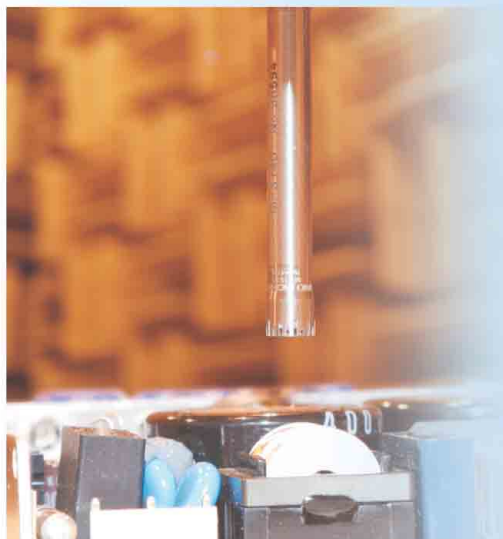
Frequency range	$10_{mHz} \sim 100_{kHz}$
Voltage input range	$10_{mVr} \sim 31.62_{Vr}$
Data recording	100_{kHz} range max., 2 channels
Number of analysis points	6400 points max.

Sound measurement of electronic components using the CF-7200 and an MI Series Microphone for measurement

6

ANALYSIS

New Possibilities for Measurement and Analysis, from Laboratories to Production Sites

Time-axis Waveform
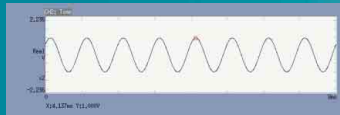
TIME

Time-axis waveform

Time

Performs A/D conversion of the raw waveform of an electrical signal of vibration, noise, pressure, strain, etc. coming from a sensor and then displays 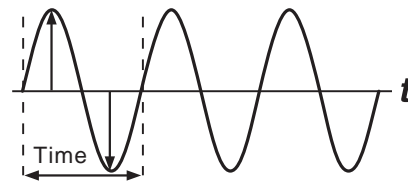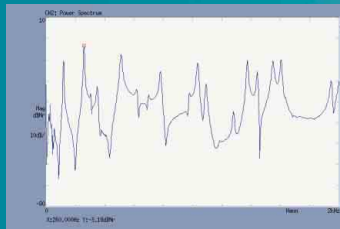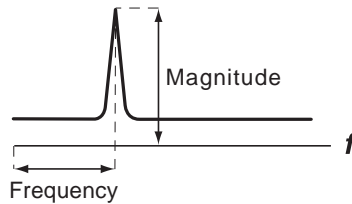the result as time-domain data. The X- and Y-axis values at any point can directly be read using the search cursor. The delta cursor function makes it easier to read the time difference and level difference.

Power Spectrum

SPECT

Power spectrum

Magnitude

Frequency

The power spectrum indicates the magnitude of frequency components contained in a sampled time-axis waveform. Frequency analysis enables detection of abnormal conditions of a facility, which are difficult to estimate through measurement of vibration and noise level and observation of raw time-axis waveform. The natural frequency of a structure can also be measured.

Frequency Response Function

FRF   PHASE

Frequency response function

PHASE

MAG

$$H = \frac{Gy}{Gx}$$
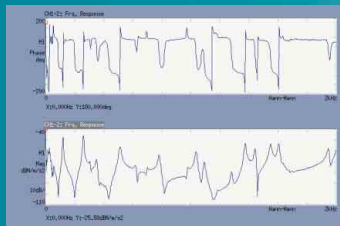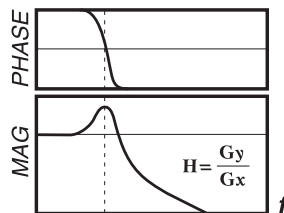
The frequency response function indicates the ratio of output to input and the frequency characteristics of phase difference. The resonant frequency and phase of a structure can easily be obtained accurately by entering the signal of vibration force generated to Ch1 by an impulse hammer or shaker and then inputting the response (signal of acceleration, velocity and displacement) to Ch2.

Hammering measurement with the CF-7200, GK-3100 Impulse Hammer and an NP Series Acceleration pickup

Analysis of micro-object using a LV Series Laser Doppler Vibration Meter and an electromagnetic shaker

Coherence Function

COH

Coherence function
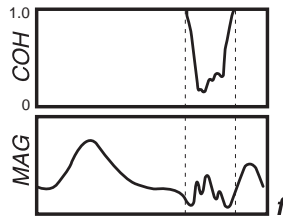
The coherence function is for evaluating the linearity and correlation of input and output of a transmission system, obtained in the frequency domain. The rate of contribution of the input signal to the output signal is represented as a digit from 0 to 1 for each frequency, for evaluating the reliability of the frequency response function, locating a key factor from multiple noise and vibration sources, and evaluating the correlation.

Inverse Fast Fourier Transform (IFFT)
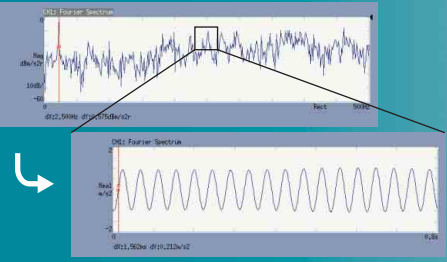
Inverse Fast Fourier transform (IFFT)
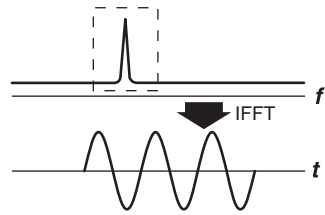
After frequency analysis, a time-axis waveform of a selected band can be obtained again by performing Inverse Fast Fourier Transform (IFFT) for the selected frequency band. For example, by selecting a waveform portion excluding an unnecessary frequency band confirmed in the FFT result and then performing Inverse Fast Fourier Transform (IFFT) for it, a time-axis waveform can be obtained with the selected high frequency band eliminated.

Hilbert Transform
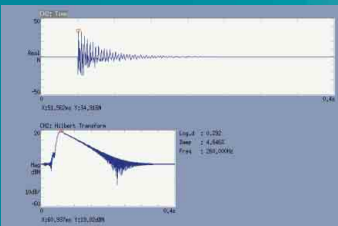
Hilbert transform
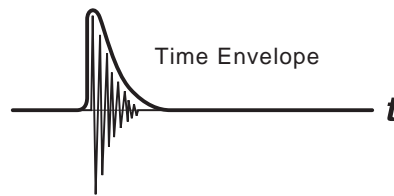
Time Envelope

A logarithmic damping factor can be obtained by obtaining a time envelope of a time-axis signal by means of Hilbert transform.

Cepstrum

Cepstrum

Spectrum Envelope
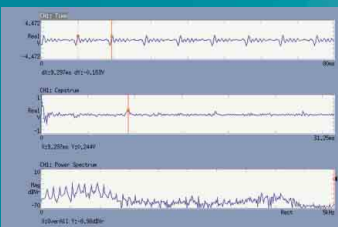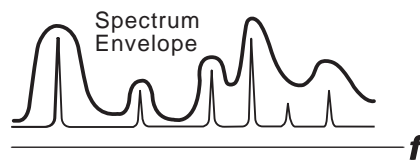
Cepstrum is obtained by performing Fourier transform of the power spectrum again, allowing detection of the periodicity contained in the spectrum. In addition, reflected waveforms can be eliminated and fundamental frequency extracted by estimating a spectrum envelope from the Cepstrum. Cepstrum can be applied to make an analysis of the sound waves, seismic waves, biowaves, etc.

Vibration measurement in a plant using the CF-7200 and an NP Series Acceleration pickup

Rotational vibration measurement of a large blower using the CF-7200

FUNCTION

EU Function

EU Function

m/s²
m/s
m
Pa
N

Volt → Direct unit reading
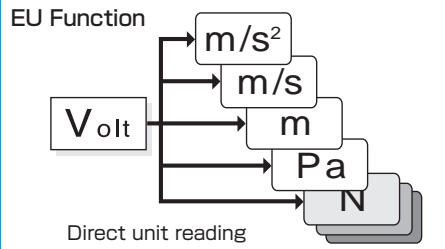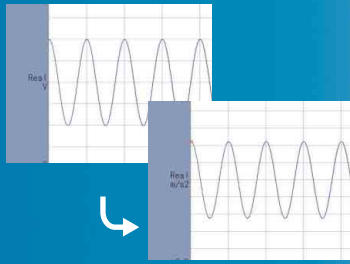
The CF-7200 FFT analyzer can not only directly read values as a voltage (V) but also as a physical quantity. When the input sensitivity has been set and calibration with a reference signal performed for each sensor, waveform values are converted to physical quantities when displayed, eliminating the need to convert from voltage values to physical quantities.

Average Summation UNDO Function

Average Summation UNDO Function

AVERAGE SUMMATION

NG!

1.0
COH
0

1.0
COH
0
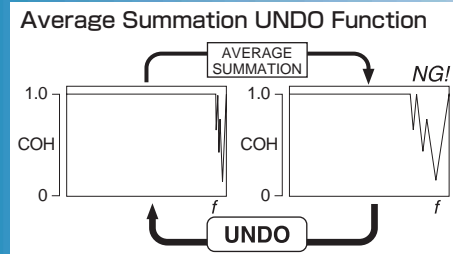
UNDO

This function is used during average summation to UNDO one average summation. For example, if you end up with a bad result of summation in impulse hammer shaking, you can cancel the result data (by UNDOing the summation) and then try the summation again.

UNDO

Differential and Integral Functions

Integral

Differential

Differential and Integral Functions

Integral   Integral

Acceleration (m/s²) → Velocity (m/s) → Displacement (m)

Differential   Differential
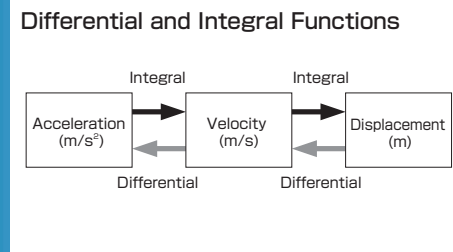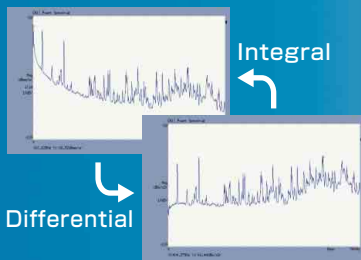
First and second order differential operations and single and double integral operations are possible for time-axis and frequency-axis waveforms. Acceleration data from an acceleration sensor can be converted to velocity and displacement; and velocity data from a laser Doppler vibration meter can be converted to acceleration and displacement and displayed. When the EU function is used together, unit conversion (among "m/s²", "m/s" and "m") is also performed automatically.

List Display
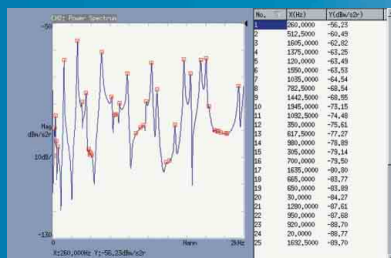
This function displays a list of X-axis and Y-axis values for selected points on a displayed waveform. Numeric list for 40 points selected, peak value list and harmonic list enable numeric values to be simultaneously checked for multiple points.

Multi-screen
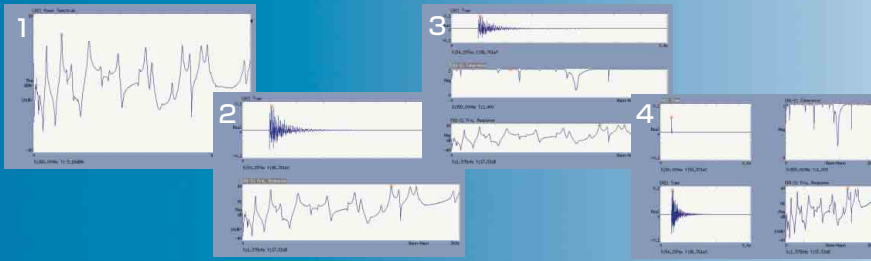
Display data can be arranged flexibly in the SINGLE, DUAL, TRIPLE and QUAD screen display modes. In the DUAL, TRIPLE and QUAD screen display modes, the difference between screens can be viewed by means of overlay display.

Zooming Analysis
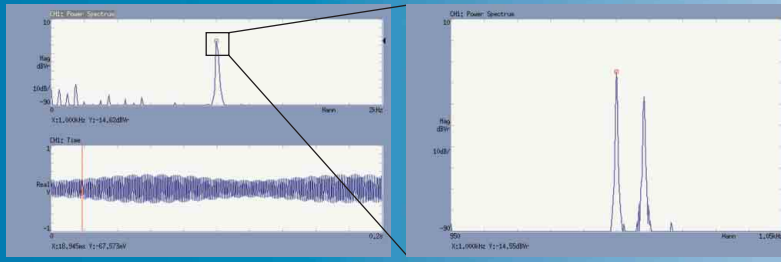
In frequency analysis, zooming analysis is possible by selecting a central frequency. This function is useful for more detailed frequency analysis, for example, analysis of beating and other waveforms involving indistinguishable adjacent frequency components.

Frequency Weighting Filters
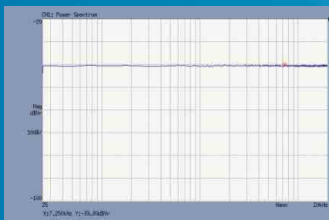
FLAT
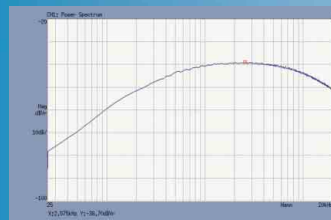
A weighting
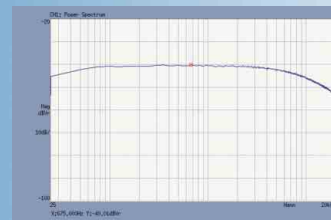
C weighting

Frequency weighting filters such as A, C and Flat weighting are provided. can be applied with A weighting and C weighting. This makes it easier to perform auditory sense correction in microphone-based acoustic analysis.

A Variety of Software for Diverse Applications

Portable 2-channel FFT Analyzer

CF-7200

Measurement Processing Software
XN-8000 Series
Simultaneous analysis of multi-frequency ranges, digital filtering and report creation

ORF

BMP

TXT

DAT
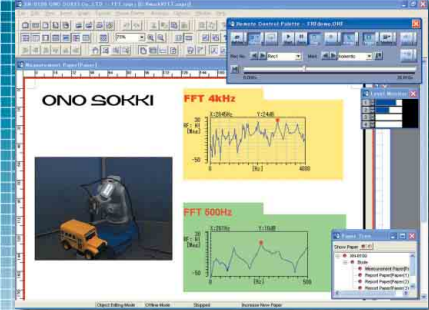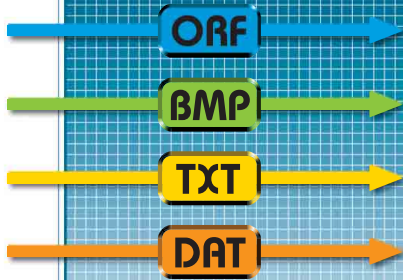
Multi-channel Data Station
DS-2000 Series
Application software for DS-2000 Series

ORF

TXT

DAT
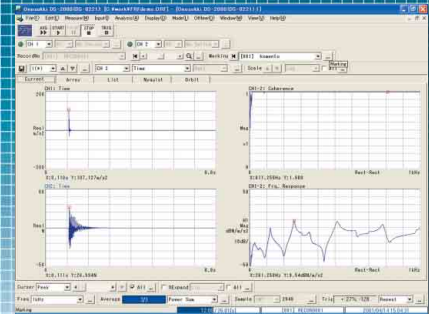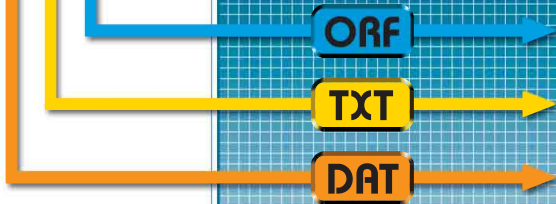
Multi-functional Graph Creation Tool
OC-1000
Report & graph creation software

DAT

BMP

TXT
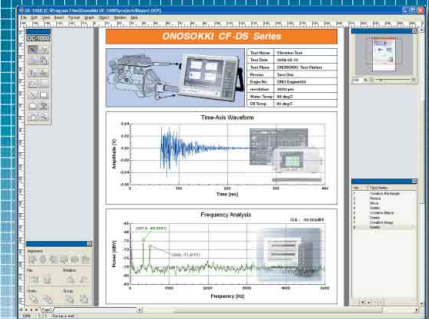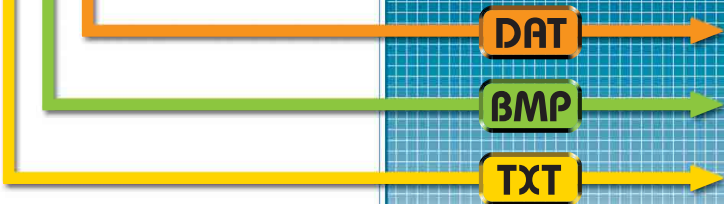
TXT Applicable to commercial spreadsheet software

〈Functions〉

Function	CF-7200 Data Format
Offline analysis	ORF format
Report	DAT format, TXT format, BMP format

〈Software〉

Software	Model
XN-8000 series	XN-8100（Platform） XN-0821（FFT analysis function）
General-purpose FFT analysis software	DS-0221L
Report & graph creation software	OC-1000

* Refer to catalogs for details.

11

System Configuration of CF-7200

Diverse options and peripheral devices can be added according to intended applications, expanding the possibilities for the portable FFT analyzer.

CH 1 | CH 2 | EXT TRIG | EXT SAMP | REV SENSOR | SIGNAL OUT | MONITOR OUT CH 1 CH 2

REMOTE

Detectors

Trigger Signal

Signal Output Connector
CF-0771 (Option)

Rotation

MX-800
Series Cable

MP-981/LG-916   Rotation detectors

Vibration

LV Series
Laser Doppler Vibrometer

NP-3000
Series Acceleration Pickup with
Built-in Preamplifier

NP-0021

NP-0120/0130/0150 Series
Sensor Cable

NP-2000 Series
Charge Output
Acceleration Pickup

CH-6130/6140
Charge
Converter

NP-0120/0130/0150 Series
Sensor Cable

NP-3000 Series
3-axis Acceleration Pickup

NP-0021×3

NP-0222/0252/0232/0262
Sensor Cable

GK-3100 Impulse-force hammer

Sound

LA Series
Sound Level meter

AX-501 Cable

MX-100 Series
Cable

MI-3110
Preamplifier

MI-1233/MI-1431
Microphone

Other Amplifiers

Peripherals

Soft Carrying Case
CC-0025 (Option)

Hard Carrying Case
CC-0071(Option)

Panel Protection Cover
CF-0701 (Standard accessory)

Remote Controller
DS-0295 (Option)

Stylus Pen CF-0702 (Standard accessory)

Monitor Line Out

Battery Pack CF-0792 (Standard accessory)

Interfaces

Speaker

Microphone

Printer

USB

USB Memory

DATA

PC

CF-0703
USB Cable (Accessory)

MEDIA

CF Card

Specifications of Portable 2-channel FFT Analyzer CF-7200

1. Input Section

Number of input channels	2 Channels			DC offset	−60dB F.S.	Auto zero ON, +30 to -20dBVr range (DC coupling)
Input configuration	Isolated single-ended				−40dB F.S.	Auto zero ON, -30 to -40dBVr range (DC coupling)
Input connector	BNC (C02 type)				AUTO ZERO: Collective operation of all channels	

Power supply for sensor (CCLD)	Supplies the current to a constant-current type sensor via a coaxial cable from the input connector (BNC terminal)	
	+24V／4mA	
IEEE1451.4 (TEDS)	Accepts an IEEE1451.4 (TEDS)-based sensor	
Input impedance	1MΩ±0.5% 100pF or less	
Input coupling	AC	-3dB at 0.5Hz or less	Automatically set to AC when CCLD is used.
	DC	—	
Absolute maximum input voltage	100VrmsAC for 1 minute (50Hz)	

Amplitude voltage range	+30dBVr	31.62Vr	-40dBVr to 30dBVr in all 8 steps
	+20dBVr	10.00Vr	
	+10dBVr	3.162Vr	
	0dBVr	1.000Vr	
	−10dBVr	0.3162Vr	
	−20dBVr	0.100Vr	
	−30dBVr	31.62mVr	
	−40dBVr	10.00mVr	

Input range step	10dB	
Input level monitor	OVER	Over: Red LED ON (95% F.S. or more)
	FINE	Appropriate level: Green LED ON (-12dB F.S. or more)
Auto range	Whenever the 1-frame data is sampled, the amplitude voltage range changes automatically if input range-over occurs.	
A/D converter	16 bits	
Dynamic range	90dB or higher: +30 to -30dBVr range	800 lines, Hanning window, 50 averages, 20℃, high-pass filter OFF
	70dB or higher: -40dBVr range	
Harmonic distortion	-80dB or less	
Aliasing	-80dB or less	
Amplitude flatness	20kHz or less ±0.1dB 20kHz to 100kHz ±0.2dB (0dBVr or less)	
Full-scale accuracy	±0.1dB	at 1kHz
Amplitude linearity	±0.015%	at full scale
Cross-talk	-100dB or less	
Gain accuracy between channels	20kHz or less: ±0.1dB (0dBVr or less) 20kHz to 100kHz: ±0.2dB (0dBVr or less)	Gain accuracy measured in the same voltage range
Phase accuracy between channels	20kHz or less: ±0.5deg (0dBVr or less) 20kHz to 100kHz: ±1.0deg (0dBVr or less)	Phase accuracy measured in the same voltage range with Equalize OFF Same voltage range ±0.1deg (typ.) with Equalize ON

Trigger	"TRIG ON" LED goes ON when trigger function turns ON	
	LED (TRIG'D) blinks when triggered	
	Position	±8191
	Mode	Free／Repeat／Single／One-shot
	Source	1 channel／2 channels／External trigger signal
	Slope	＋／−／±
	Hysteresis level	Arbitrary setup
	Trigger level	Arbitrary setup
	External trigger	Input connector: BNC (C02 type)
		Input voltage: ±10V
		Input coupling: AC／DC
		Input frequency: 100kHz max
		Hysteresis level: Arbitrary setup (default 500mV)
		Input impedance: 100kΩ

Filter (Simultaneous use of filters not possible)	A weighting filter, C weighting filter	Conforms to IEC 60651-1979 TYPE1, ANSI S1.4-1983 TYPE1, and JIS 1505-1988 TYPE1
	High-pass filter	10Hz (−18dB／oct)、100Hz (−18dB／oct)
	Low-pass filter	1kHz (−18dB／oct)、10kHz (−18dB／oct)

External sampling input	BNC (C02 type) input	Input voltage: ±10 V／TTL
		Input impedance: 100kΩ
		Input coupling: AC／DC
		Hysteresis level: Arbitrary setup (default 500mV)
		Input frequency: 256kHz (direct sampling not possible)
	R03-R6F input	MP-981or LG-916 rotation detector (DC12V±0.6V, Max. 100mA) · ONO SOKKI's made detectors
	* BNC (C02 type) input or rotary encoder input is selected. Simultaneous input not possible	

Remote control	When the DS-0295 Remote Controller is connected, start／stop and custom-selection operations are possible.	
Voice input／output for voice memo	Sound input and playback with a built-in microphone and speaker Voice memo can be stored by linking the measurement data.External connection has priority.	
	External MIC input: φ2.5 stereo mini jack input (L)	
	External SPEAKER output: φ3.5 stereo mini jack output (L)	

2.Display Functions

Display mode	SINGLE screen display mode／DUAL screen display mode／TRIPLE screen display mode／QUAD screen display mode／OVERLAY display mode	
List display mode	Harmonic	
	Peak list display／Arbitrary point list／Octave list display	
Label function	Input	Direct handwriting using a stylus pen
	Color	8 colors
	Line type	3 different thicknesses
	Display	Show／hide

Search function	Delta function	X mode／Y mode／XY mode
	Partial OA／Peak／p-p／MAX-MIN／Search enhance	
Vertical axis unit	rms／PEAK／0-p／p-p／V／V2／PSD／ESD Automatic unit conversion function- Unit conversion by integral／differential operations (displacement←→velocity←→acceleration)	
Vertical axis scale	Auto／Manual／Default／Gain／Phase unwrap function／Delay	
Horizontal axis unit	Hz／r/min／Order (*under development)／s (sec)／EXT	
Horizontal axis scale	Zooming with default／delta cursor	
Calculation functions	Differential and integral operations／FRF equalization／Inverse Fast Fourier Transform／Hilbert transform／Damping calculation by half-value width method	

3.Display Unit

Size	10.4-inch		Resolution	800 x 600 dots
Type	TFT color LCD with touch panel function		Lighting (back light)	Cold-cathode tube, 2-level brightness adjustment

4. Analysis Section

Frequency accuracy	±0.005% of reading (±50ppm)
Frequency range	10mHz to 100kHz
Sampling frequency	Frequency range x 2.56 (internal sampling)

Number of sampling points／analysis points	Number of sampling points	Number of analysis points
	256	100
	512	200
	1024	400
	2048	800
	4096	1600
	8192	3200
	16384	6400

Overlap processing	MAX／66.7%／50%／0%
Window functions	Rectangular／Hanning／Flat-top／Force／Exponential／User-defined
Delay function	Time frame of channel 2 can be delayed by 0 to 8191 points with reference to channel 1.

Time-axis waveform processing function	The time-axis waveform processing function can be selected with soft keys.	
	First and second order differentials, Single and double integrals	
	Absolute value conversion／DC cancel／Trend elimination／Smoothing／Hilbert conversion	
Real-time analysis	40kHz／2 channels (internal sampling: 4096 points)	
Search enhance	Calculation resolution	x32
	Y-axis accuracy	±0.1dB
Averaging mode	Setting of number of averages: 1 to 65535 Averaging setup time: 0.1 to 999 seconds (in 0.1-second steps) Averaging can be stopped in terms of the number of times or time.	
	Time domain	Summation average／Exponential average
	Frequency domain	Summation average／Exponential average／Peak hold／Subtraction average／Sweep average／Fourier average／Max OA
	Amplitude domain	Summation average
	A／D-over cancel／Double hammer cancel／Averaging permission select function (ADD+1)／Averaging undo function	
FFT operation	32-bit floating point (IEEE single-precision format)	

5.Processing Functions

Time domain	Time-axis waveform／Auto-correlation function／Cross-correlation function／Impulse response／Cepstrum/Liftered envelope／Hilbert transform	
Amplitude domain	Amplitude probability density function／Amplitude probability distribution function	
Frequency domain	Spectrum	Power spectrum／Fourier spectrum／Cross spectrum／Phase spectrum
	Frequency response function (FRF)	Real part／Imaginary part／Nyquist diagram／H1／H2／equalized waveform of FRT／Coherence function／Coherence output power／Coherence blanking
	Miscellaneous	Power spectrum to 1/1 octave／Power spectrum to 1/3 octave／Vibration sensory correction (horizontal／vertical)

6.Memory Functions

Data record	Frequency range	100kHz(MAX)		File format	Analysis data can be saved simultaneously with three different formats: DAT, TXT and BMP(TXT and BMP selectable).	
	Recorded channels	Ch1&Ch2 (Max.100kHz),Recording of single channel is not possible.		Panel condition memory	10 types	
	Recording time	2GB: Approx. 33 minutes (Ch1 and Ch2 at 100kHz)		Contents of panel condition memory	Memorizes parameters which can reproduce all software and hardware settings in the panel condition memory mode.	
	Recording format	ORF		Voice memo memory	200 data items or less (depending on the CF card capacity)	
	Max. recordable memory capacity	2GB (in a CF card slot)		Handwritten memo memory	200 data items or less (depending on the CF card capacity)	
	Record number	Automatic numbering by main unit start/stop operation		**Recording device**	Main unit built-in memory (fixed) or CF card can be selected.	
	Event mark number	Arbitrary numbering by [MARK] button operation			Main unit built-in memory	x1 (Cannot be replaced by user)
	Off-line analysis	ORF			Card slot (CF card)	x1
		FFT analysis is possible at recording frequency range or lower.			CF card insertion／removal warning LED	When LED (green) is lit, insertion or removal of memory card is inhibited.
Data file	Max. recordable memory capacity	200 data items, 10 record data items (depending on the CF card capacity)				

7.Output Functions

Interface	**USB**	Number of ports	2	**Printer output**	Printer interface	USB
		Standard	USB Ver.1.1／2.0〈High Speed〉		Device	Accepts thermal printers of recommended model
		USB (type A)	For USB1.1 printer／USB memory		Source	On-line data
		DATA (mini B type)	For USB2.0 USB node function			Saved data
External SPEAKER output	Number of connectors	1		**Monitor output**	Number of connectors	2	Each connector outputs Ch1 or Ch2 data
	Maximum output	100mW or more			Output voltage	1Vrms F.S. ±1% for input voltage range F.S. (1kHz sine wave, 1MΩ load)
	Impedance	8Ω			Impedance	Approx. 33Ω
	Voice memo	Play back			Source	Input signal (after analog filtering)
	Connector	Accepts ϕ=3.5 stereo mini jack (L)			Connector	ϕ=2.5 monaural jack
	Output adjustment	By software				

8.Signal Output (CF-0771) — Option

Number of channels	1		**Frequency range**	0.1mHz to 100kHz (sine wave)	
Output connector	BNC (C02 type)			Band limiting not possible	
D／A converter	16 bits		**Harmonic distortion**	-70dB or less	
Maximum output voltage	±10V (Amplitude + DC offset)			Prescribed with $1V_{0-p}$ amplitude value	
Amplitude resolution	Approx. 2.5mV		**Output ON/OFF**	Turned on or off with the SIGNAL OUT button(Turned off at the time of activation)	
Offset resolution	Approx. 5mV			ON/OFF for each button	
Output format	Unbalanced output			ON	LED goes on when ON.
Protection circuit	Short-circuit protection			OFF	LED goes off when OFF.
Isolation	No isolation	No isolation between chassis and digital common	**Output waveform**	Sine wave	
Output impedance	0Ω	Low impedance output (unbalanced)		Swept sine	
	50Ω	±10%		Pseudo random	
Output current	50mA (If 10mA is exceeded, harmonic distortion, flatness, and crest factor are not prescribed.)			Random	
				Impulse	
Output mode	Continuous		Analysis frame length	256 to 4096	
	Burst	Can be set from 1 to 32767 in 1-cycle steps	Zoom mode analysis	Possible for all waveforms	
		Interval 62.5μs to 524s (Can be set in 62.5-μs steps)	**Spectrum flatness**	±1.0dB or less	20kHz—100kHz
		Single-shot		±0.2dB or less	0—20kHz
		Continuous	**Crest factor**	Sine wave	About 1.41
		Time setup is possible.		Swept sine	About 1.4 to 1.6
Taper function	The output can be gradually increased or decreased when the signal is turned on or off.			Pseudo random	3.3 or less
	Taper rising time	1ms to 32s (in 1-ms steps)		Random	3.3 or less
	Taper falling time	1ms to 32s (in 1-ms steps)		Impulse	32.0 or less
			Pink filter	Analog filter: -3dB／oct ±1.0dB (prescribed for 20Hz to 20kHz)	

9.Miscellaneous Functions

Condition view	List display of condition settings Can be saved in the XML (Text) format of condition.		Clock	Date (year, month, day) and time (hour, minute, second)
			Operation beep	Can be turned on or off (in conjunction with ON／OFF of warning beep)
			Warning beep	Can be turned on or off (in conjunction with ON／OFF of operation beep)

10.General Specifications

Power requirement	Input voltage	10.5 to 16.5VDC	Outside dimensions (not including the handle and protrusions)	328mm(W) x 246mm(D) x 88mm(H) (battery not mounted)／328mm(W) x 246mm(D) x 120mm(H) (battery mounted)／Refer to outer dimensions for details	
Power connector	DC jack (EIAJ TYPE5) Outer side: Negative electrode, Inner side: Positive electrode				
Power consumption	About 60 VA (AC adapter used)		Suspension of chassis	VESA standard 100 x 100 (mm)／Can be suspended by attaching a ϕ5 adapter	
Operating temperature range	0 to +40℃		Stylus pen	Can be stored in the main unit (accessory)	
Storage temperature range	-10 to +50℃(including an external secondary battery)		Carrying handle position	0˚ (top level position)／30˚／60˚／90˚／110˚／130˚／180˚ (bottom level position)	
Functional grounding terminal	Grounding terminal for noise elimination		**Main unit cooling**	Forced-air cooling by an electric fan	
				Operating noise	32.5dB(A) (Reference value)
			Weight	Approx. 3.5kg／Approx. 4.8kg (battery pack mounted)	

11.AC Adapter (SQ60W15P-03)

Input voltage	100 to 240VAC
Input frequency	50／60Hz
Output voltage	Rating 15V
Output current	Rating 4A
Safety standard	Electrical Safety Law／CE／UL

12.Battery Pack (CF-0792)

Battery	Lithium ion secondary battery
Shape	Fixed to the rear section of the main unit (detachable)
Operating time	Operates for 4 hours under standard operating conditions (2ch FFT analysis／Signal output option not mounted／25℃ room temperature with a new battery
Remaining battery level display	Displays the remaining battery level when operating on the secondary battery 4-level display.
Minimum remaining battery level	Displays a warning message and shuts down automatically.
Charge	Charged by the AC adapter when the main unit power is OFF.
Charge time	About 8 hours (power OFF)

⟨Outer Dimensions⟩

(mm)

⟨**Main Unit**⟩
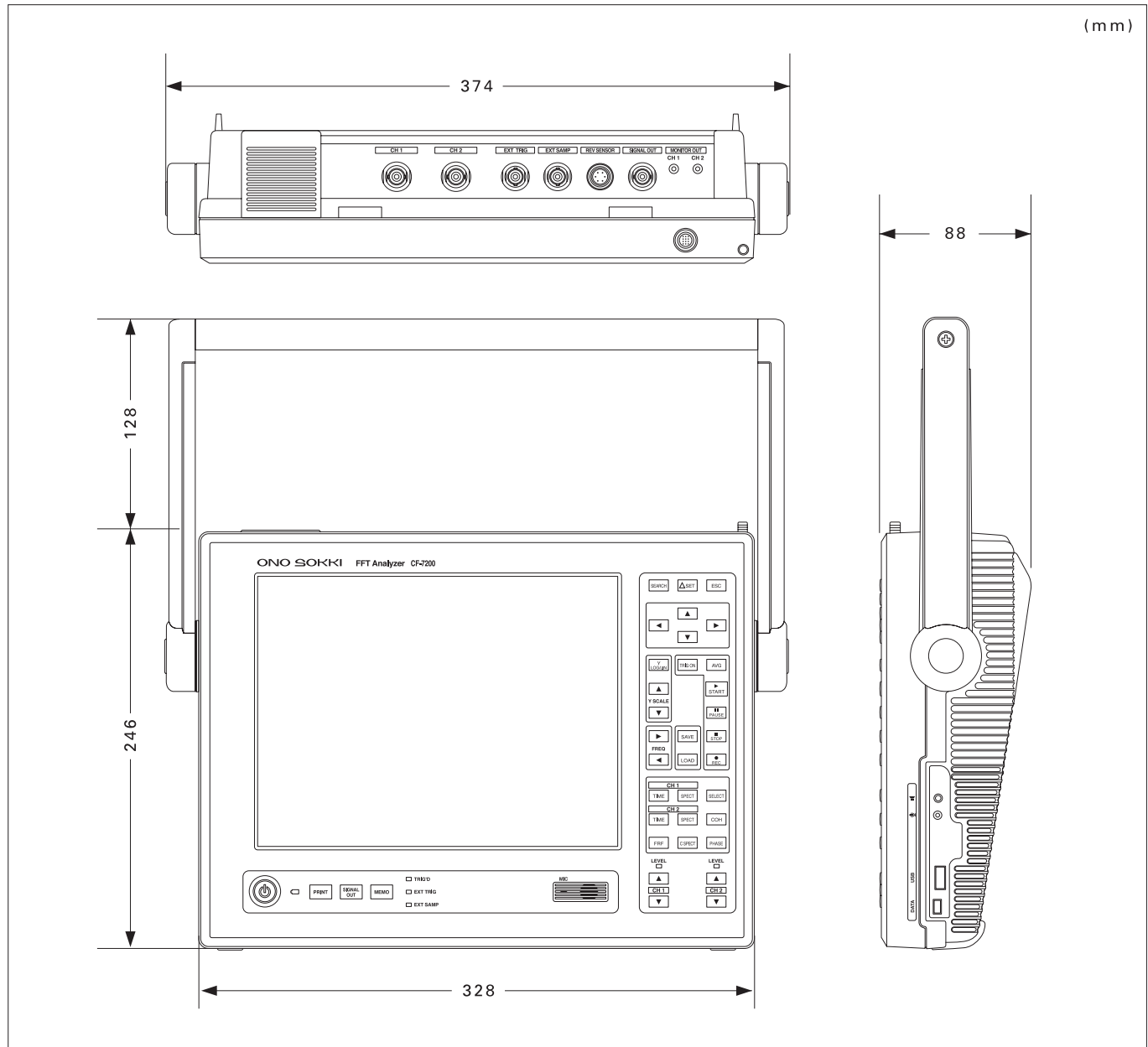
Model Name	Product Name
CF-7200	Portable 2-channel FFT Analyzer

⟨**Standard Accessories**⟩

Model Name	Product Name
CF-0792	Battery Pack
CF-0701	Panel Protection Cover
CF-0702	Stylus Pen
CF-0703	USB Connection Cable
SQ60W15P-03	AC Adapter

⟨**Options**⟩

Model Name	Product Name
CF-0771	1Ch Signal Output Module
CC-0025	Soft Carrying Case
CC-0071	Hard Carrying Case
DS-0295	Remote Controller
——	Rack Mount Adapter

⟨**Recommended Products**⟩

Model Name	Product Name
SDCZ2-512-J65A	USB memory 512MB（Cruzer mini）
SDCFH-512-903	CF card 512MB (Sandisk Ultra)
SDCFH-1024-903	CF card 1GB (Sandisk Ultra II)
BL-112UI	Thermal printer
HM-131	Speaker microphone

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