Utilizes the latest, all inclusive technology
in a high performance analyzer

Capable of providing measurement, analysis,
and reports all on one display

CF-3600 Portable FFT Analyzer

ONO SOKKI

CE

With its portability, the CF-3600 provides a less restricted and more convenient testing platform while still achieving high accuracy in vibration and noise measurement and analysis.

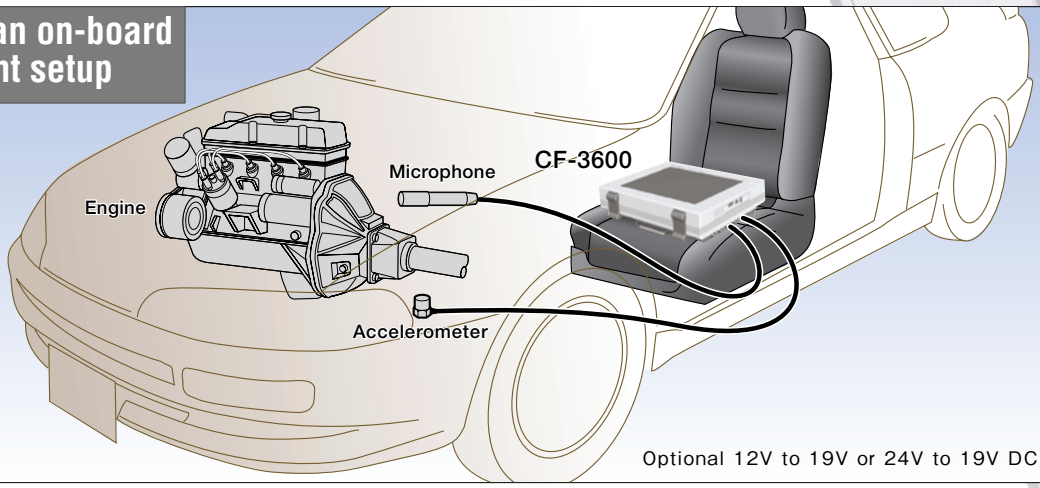
Introducing the CF-3600 Portable FFT Analyzer

Easy Setup

The ease of transportation and setup make the CF-3600 ideal for work on the jobsite.

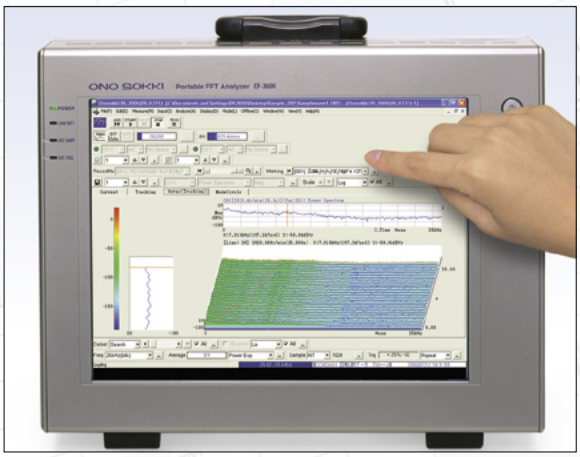
Simply plug the CF-3600 in and connect the sensors and it is ready to take measurements. The lightweight all-in-one construction makes using the unit at a jobsite easy and efficient. A battery backup ensures the data will never be lost in the event of a power loss.

Example of an on-board measurement setup



Direct Interface

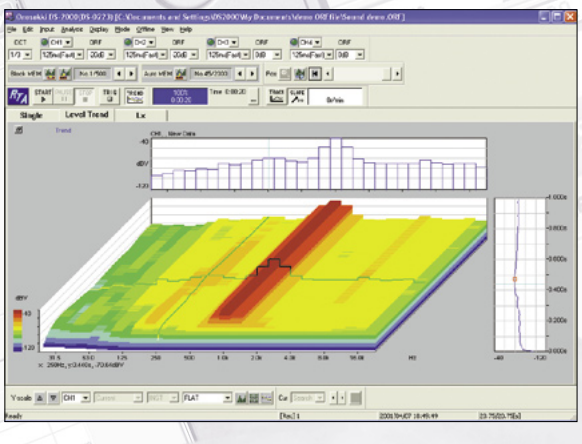
The CF-3600 comes equipped with a 15 inch color touch panel monitor providing direct, intuitive operation and eliminates the need of a keyboard and mouse.



Various Analysis

Combining power with flexibility, the CF-3600 provides a wide array of analysis tools. These include:

- Noise and vibration measurements
- Tracking analysis provides the capability to evaluate rotating machines and engine dynamic characteristics.
- With realtime octave analysis, acoustical analysis is provided.
- Throughput disk function writes waveform data directly onto the built-in hard disk.
- Supports a wide range of application software.



Smart Report

Creating reports at the jobsite becomes easy with the use of secondary processing software.

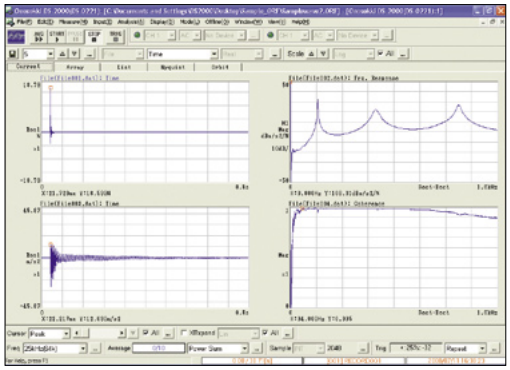
With spreadsheet software or graph creation software, users can easily create graphs and reports, and then export those files via the convenient USB and LAN interfaces to a wide array of peripheral equipment such as a printer.

Frequency Response Function Measurement

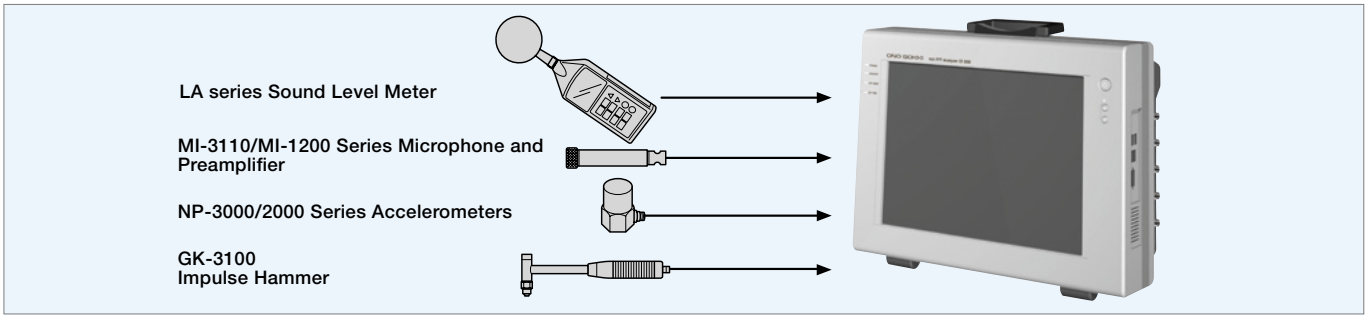
CF-3600T/CF-3600R

Resonance may cause not only chattering vibration in robots and machine tools but also vibration and noise in automobiles and home appliances. The most popular method for analyzing resonance is measurement of the frequency response function of the object in question, using an impulse hammer.

Excitation by an impulse hammer is the ideal choice at the jobsite measurement for troubleshooting because it reduces measuring time without the need to mount an exciter on the object. CF-3600 performs FFT signal analysis of 4 channels simultaneously with 40 kHz and 1/6400 frequency resolution.



Sample Data displaying of Frequency Response Function

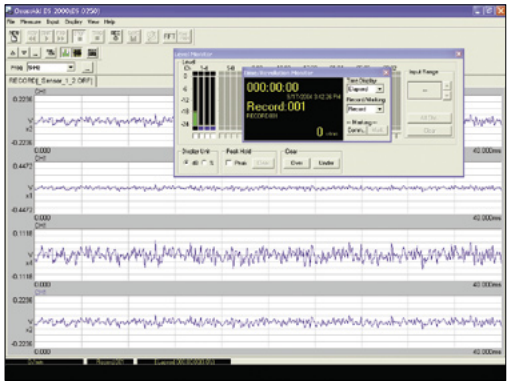


Throughput Disk Function

CF-3600T/CF-3600R

The ability to directly store the original signal waveform to the HDD of CF-3600 eliminates the needs to save to a data collector then retrieve it. This also allows you to store the data in non-degrading digital status. Use the data you recorded visa the throughput disk function to analyze it on the CF-3600, as well as the offline analysis at PC on which DS-0221, DS-0222 or DS-0223 are installed. By changing the measurement and analysis conditions allows for flexible analysis.

Note: Please inquire separately regarding the licensed version of DS-0221, DS-0222, DS-0223, and other software.



Sample Execution Displaying of Throughput Disk Function

Maximum recording time (minutes) ＊Recording time at AD conversion with 16-bit data only

f range \ ch	4
40kHz	87 min
20kHz	175 min

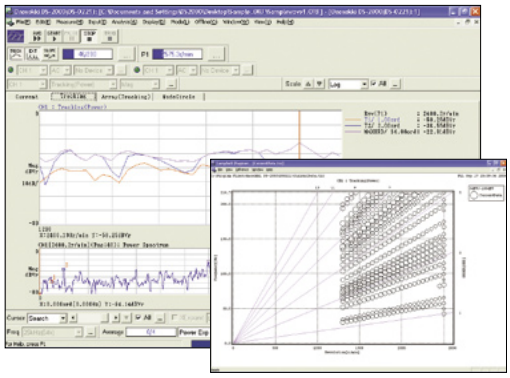
File Export Function (Option: DS-0251)

Convert files saved by the throughput disk function in ORF format into WAV, TXT, DADiSP, MATLAB, UFF, and other formats, and export them to other applications for secondary analysis.

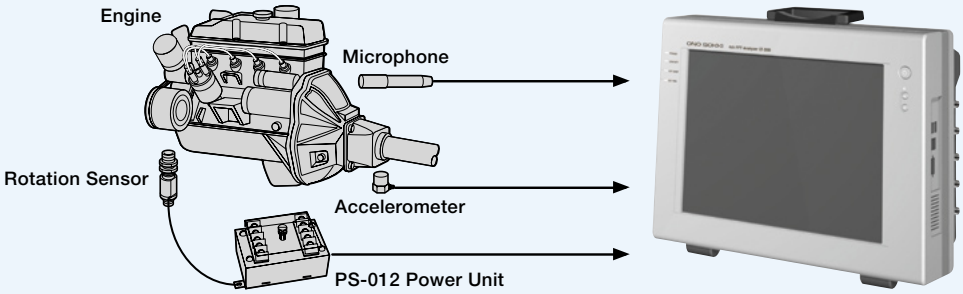
Tracking Analysis

CF-3600T

Rotating machinery such as engine, compressors and turbines etc. must cover wide range of rotating speed from very low to high speed. The most important issue is resonance which is caused by the rotational speed of the rotating machinery, which rotational frequency is same as the natural frequency of rotating machinery's components (e.g. axles, gears and brackets.).
In case of torsion vibration in large power generators and the like, resonance can cause serious accidents, creating vibration excitation energy that exceeds the tolerance of the machinery, destroying it.
Rotational tracking analysis is an effective method to identify the rotational speeds at which resonance occurs in rotating equipment, and which components generate vibration or noise, and to identify the orders (multipliers) of the rotating speed that generate vibration and noise.



Sample Data Displaying of Tracking Analysis and Campbell Plot Function

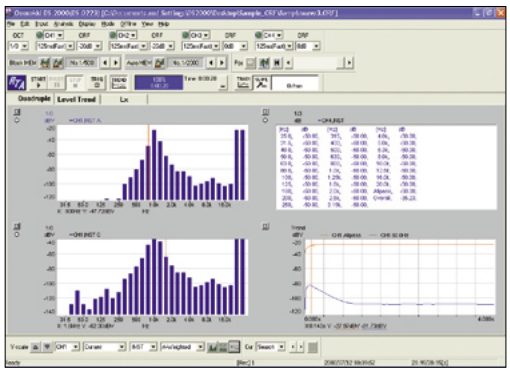


Real Time Octave Analysis

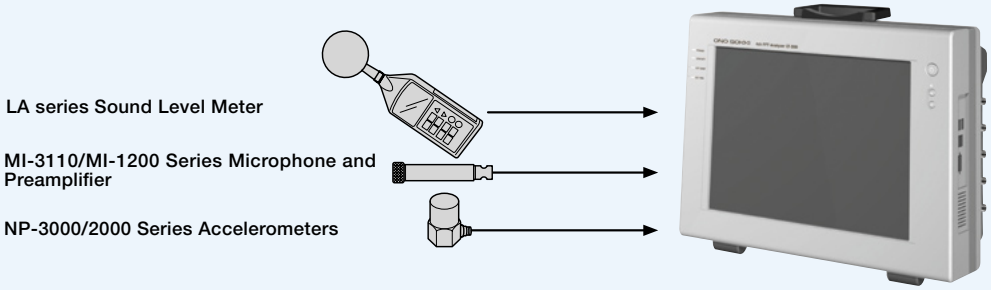
CF-3600R

In order to solve the noise problem, the frequency analysis is required. Especially octave analysis has long been used for frequency analysis.
An octave is a frequency with ratio of 1:2 to the frequency that is, double the frequency. The human ear senses sounds in geometric progressions to the frequency. A series of octave bands based on 1 kHz has been standardized, and the acoustic pressure level of each band.

The octave band based on 1 kHz is called the 1/1 octave band, while the bands formed by dividing into third are called the 1/3 octave bands.
CF-3600R performs real time octave analysis of 4 channels simultaneously.

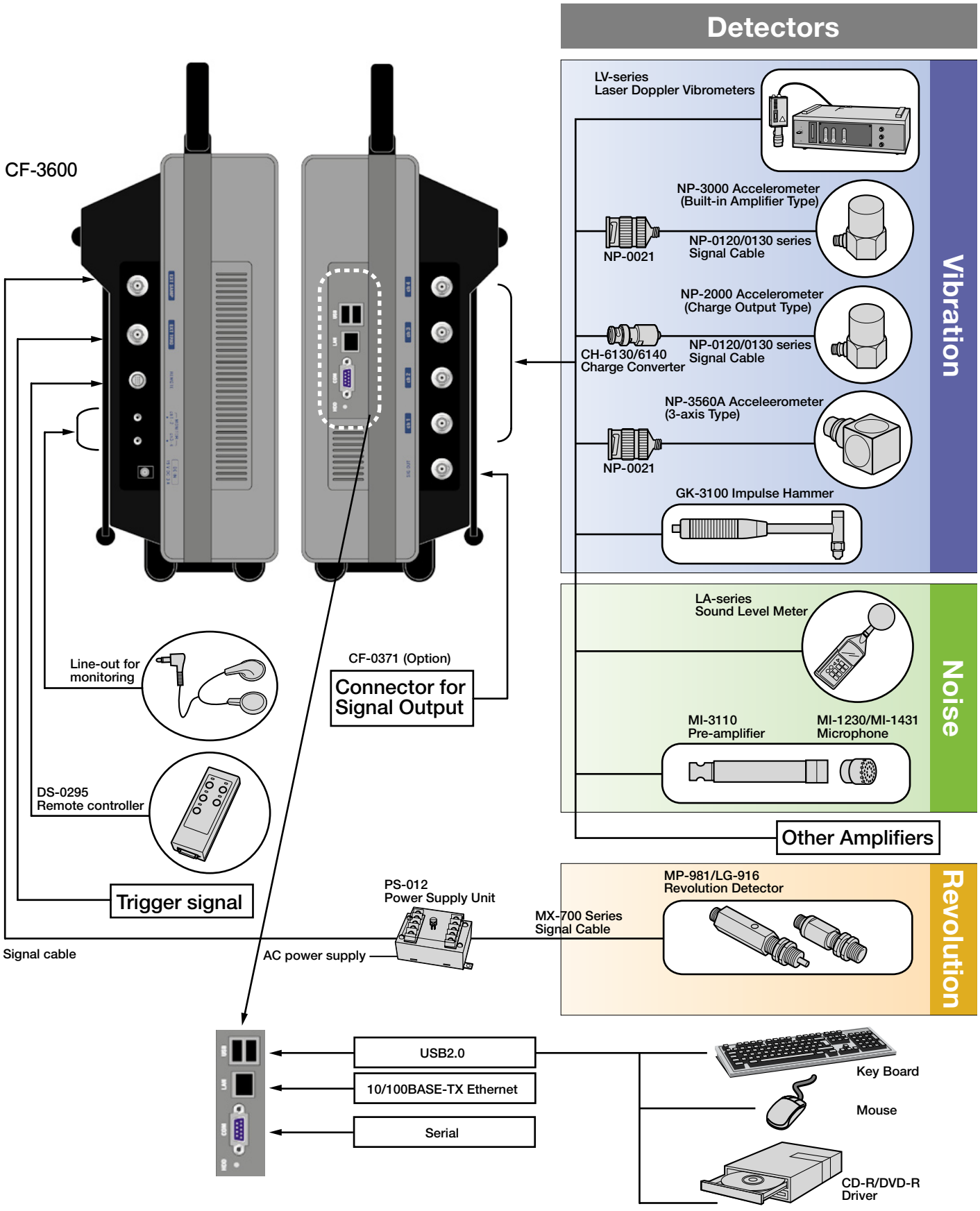


Sample Data Displaying of Octave Analysis



System Configuration

Various options and peripherals of CF-3600 can expand the possibilities of the flexible measurement and analysis.



Please refer to the separated exclusive catalogue of each detectors and their peripherals in details.

Specification of CF-3600 FFT Analyzer

Basic Specification

■ Touch Panel Computer Section	
CPU	VIA Eden 533 MHz
Memory	256 MByte
HDD	30 GB *Flash disk drive (4 GB) is optional.
Net Work	10BASE/100BASE-TX 1 pc.
LCD	15 inch XGA 1024 x 768 dots
USB	USB2.0 x 2 pcs.
OS	Microsoft® Windows® XP Professional

■ General Specification	
Dimension	410(W) x 314(H) x 150(D) mm *Excluding protrusion
Rated power voltage	19 VDC ±5%
Power consumption	Approx. 70 VA (at 100 VAC AC adaptor is used.)
Operating temperature	5 to 40℃ (0 to 40℃ when the optional flash disk drive is built-in.)
Storage temperature	−10 to 60℃
Weight	Approx. 10 kg
Cooling fan	Not-provided (Natural air cooling)
Treatment against instantaneous power failure	Battery charging circuit which battery pack (Lithium-ion secondary cell) is provided. *Operating time by battery is Max. 20 minutes.

■ Measurement Section	
FFT real time rate	40 kHz/4 channels
No. of iput channel	4 channels
External sampling input	1 channel, AC/DC, ±0.5 to ±10 V 0 to 85 kHz ±10% (−3 dB, with band pass filter) No. of P/R: 0.5 to 1024
External trigger input	1 channel, AC/DC, ±0.5 to ±10 V

■ Panel LED Section	
Power ON	Green
Low battery	Red *Flickering when the battery against power failure becomes low voltage.
External trigger signal	Green
External sampling signal	Green

Signal Input/Output Section

■ Signal Input Section	
No. of channel	4 channels
Type of input connector	BNC
Configuration	Single ended
Impedance	1 MΩ±0.5%, less than 100 pF
Coupling	DC or AC (less than −3 dB 0.55 Hz)
Current supply for sensor	2 mA/4 mA
Analogue filter	Acoustic A, B, C characteristic (provided as standard)
Amplitude range	−40 to +20 dBVrms (Every 10 dB step, 7 ranges)
Withstand input voltage	AC 70Vrms for one minutes (50 Hz)
Frequency range	0 to 40 kHz
Sampling rate	32, 44.1, 48, 51.2, 64, 102.4 kHz etc.
Frequency accuracy	Less than ±50 ppm
AD converter	24 bit (⊿Σ type)
Dynamic range	100 dB
Full scale accuracy	Less than ±0.1 dB (at 1kHz)
Cross talk	Less than −90 dB (at 1 kHz)
Gain accuracy between channels	Less than ±0.3 dB
Phase accuracy between channels	Less than 0.5 degree (DC to 20 Hz) Less than 1 degree (20 to 40 kHz)
Digital filter	Anti-aliasing filter

■ Signal Output Section (Option: CF-0371 1 Channel Signal Output Module)	
No. of channel	1 channel
Output connection	BNC connector
Output impedance	50 Ω±10%
Amplitude of voltage	±10mv to ±10V
Frequency range	0 to 40 kHz
Conversion rate	32, 44.1, 48, 51.2, 102.4 kHz etc.
DA converter	20 bit 24 bit (⊿Σ type)
Type of signal output	Sine, Swept sine, Random, Artificial random, Impulse, Octave band noise, Pink noise, Analogue output of time record data
FFT analysis length	64/128/256/512/1024/2048/4096
Voltage amplitude accuracy	Less than ±0.5 dB
Octave band filter	6th Butterworth (1/1, 1/3 octave)
Octave band noise	1/1 oct - 1 Hz to 16 kHz, 15 bands 1/3 oct - 0.5 Hz to 20 kHz, 47 bands
Pink filter	Analogue filter -3 dB/OCT ±1.0 dB (at 20 Hz to 20 kHz)
Output mode	Continuous/Single burst/Continuous burst
Taper function	Provided (1 ms to 32 S) Not available when burst function is set at ON.
Limitation of frequency range	Not effective for swept sine, artificial random, impulse signal at the frequency range at 8 kHz, 1.6 kHz, 320 Hz, 64 Hz.

■ Line-out for Monitoring Section
2.5 φ mini-stereo jack x 2 pcs. are used (for CH1/2 and CH3/4).
1 Vrms ±1.0%/FS (full scale) against input voltage range (non-load 1 MΩ)

Accessories Section

■ Accessories	
Instruction manual	1 copy
AC adaptor	1 pc.
Power cable for AC adaptor	1 pc.
Remote control box with cable	1 pc.
Front panel protection cover	1 pc.
Battery pack	1 pc. (Lithium-ion secondary cell, model DR202B)

■ AC Adaptor Specification	
Rated input voltage	100 to 240 VAC
Frequency	50 to 60 Hz
Output voltage	19 VDC
Output current	4 A

■ Remote Controller Specification	
External dimension	45(W) x 25(H) x 117(D) mm *Excluding protrusion
No. of operation button	5 pcs. (START/STOP/F1/F2/F3) *User's defined key at F1/F2/F3
LED	5 pcs., Green LED (Displaying the status)

CF-3600T
Tracking Analysis Set

■Configuration
- Main unit of CF-3600
- FFT Analysis Software
- Tracking Analysis Software
- Throughput Disk Function Software
- Standard Accessories
  (AC adaptor, Battery pack, Front panel protection cover, Instruction manual)

CF-3600R
Real-time Octave Analysis Set

■Configuration
- Main unit of CF-3600
- FFT Analysis Software
- 1/1, 1/3 Real Time Octave Analysis Software
- Throughput Disk Function Software
- Standard Accessories
  (AC adaptor, Battery pack, Front panel protection cover, Instruction manual)

■Optional Hardware

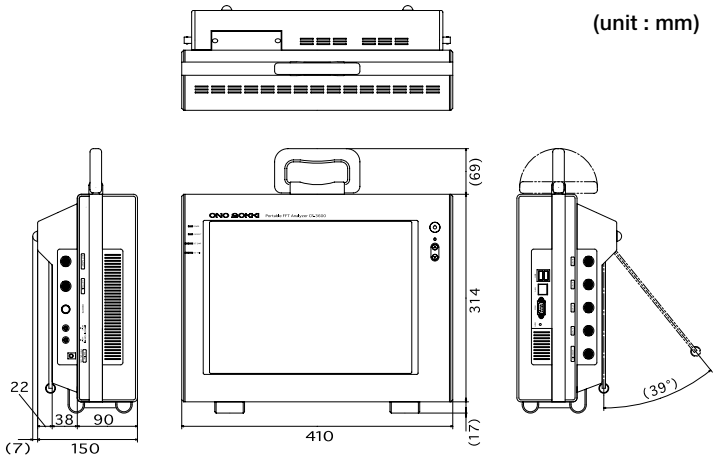
CF-0371 1 channel signal output module
CC-0036 Hard carrying case

■Optional Software

DS-0221 FFT Analysis
DS-0222 Tracking Analysis
DS-0223 1/1, 1/3 Real Time Octave Analysis
DS-0244 Campbell Plot Function ＊DS-0222 is required in order to activate DS-0244.
DS-0250 Throughput Disk Function
DS-0251 File Export Function ＊DS-0250 is required in order to activate DS-0251.
(Applicable for WAV, TXT, DADiSP, MATLAB, UFF)

External drawing

(unit : mm)



LCD is covered by protection cover (standard accessory).