SUPER CMS 10000

Sensor

Sensor type	Model	Description	Sensor type	Model	Description
Vibration pickup	Selectable	High sensitivity, wide band, ultra high/low temperature,submersible	Vibration pickup	PU-441	Side cable connection, intrinsically safe (explosion-proof), waterproof, insulated
	PU-611	Side cable connection, general purpose, waterproof, insulated		PU-451	Top cable connection, intrinsically safe (explosion-proof), waterproof, insulated
	PU-621	Top cable connection, general purpose, waterproof, insulated		PU-446	Side cable connection, with connector, intrinsically safe (explosion-proof), waterproof, insulated
	PU-616	Side cable connection, with connector, general purpose,waterproof, insulated		PU-456	Top cable connection, with connector, intrinsically safe (explosion-proof), waterproof, insulated
	PU-626	Top cable connection, with connector, general purpose, waterproof, insulated	Velocity sensor	Selectable	General purpose, or intrinsically safe (explosion-proof)[1]
	PU-661	Side cable connection, high temperature, waterproof, insulated	Displacement sensor	Selectable	General purpose, or intrinsically safe (explosion-proof)[1]
	PU-671	Top cable connection, high temperature, waterproof, insulated	Temperature sensor	Selectable	Resistance thermometer, etc.[1]

[1]: A signal conversion amplifier is additionally required.

Local station

Types of configuration units

Unit name		Max. input channels for each unit			
		Vibration	Analog	Contact	Pulse
Base unit		16ch	8ch	8ch	4ch
	Vibration measuring (Daisy chained wiring)	32ch×2	—	—	—
Expansion unit	Vibration measuring	64ch	—	—	—
	Analog measuring and contact input	—	32ch	32ch	—
Function unit	Real-time vibration measuring	12ch	—	—	4ch
		24ch	—	—	4ch

[2]: Max. 3 of expansion unit or Max. 3 of function unit can be individually connected to a base unit.
Note that any combination of units can be connected up to 5 units in amount.

Specifications of FFT analysis

Sampling	With alarm automatic, regular interval automatic, arbitrary
Frequency range	10, 20, 50, 100, 200, 500, 1k, 2k, 5k, 10k, 20kHz
Resolution	100, 200, 400, 800, 1600, 3200, 6400, 12800, 25600, 51200 lines[5]
Window function	Rectangular, Hanning, Hamming, flat top
Averaging	Time synchronized averaging, averaging, overlap
Analysis support	Multi-channel simultaneous FFT, continuous FFT, triggered measurement, zooming, harmonic analysis, side-band analysis, order scaling
Cursor function	Single, twin, band, synchronized, $\varDelta t$, $\varDelta f$

[5]: Automatic and continuous processing can be used only in the range of 100 to 6400 lines.

Specifications of pulse measurement

Input signal	TTL level input (for time synchronized averaging trigger)

Specifications of contact output

Output signal	Caution alarm, danger alarm
Contact capacity	Load voltage : 250 VAC(DC) ; Continuous load current : 0.2A

Specifications of vibration measurement

Measurement mode Frequency Range	Measurement mode	Frequency mode	Measurement range
	Acceleration ALL	5～20kHz	～1500m/s²$_{0-p}$[4]
	Acceleration BPF	1k～20kHz	
	Acceleration PEAK	1k～20kHz	
	Acceleration ENV	1k～20kHz	
	Velocity	5～1kHz	～1000mm/s$_{0-p}$[4]
	Displacement	5～1kHz	～10000μm$_{P-P}$[4]

Measurement interval	Base unit/Vibration scanning unit	Real-time vibration unit
	5 ～ 10s x number of channels	1 s

Data summary report	Base(interval 1 to 900s)[3], hourly, daily, weekly, monthly and yearly reports
Calculating item	Average, max., min., crest factor, measurement condition signal
Alarm criteria	Relative value alarm, variation value alarm, group alarm
Signal abnormality criteria	Sensor fault, abnormal measurement value

[3]: Can be used only in real-time vibration measurement.
[4]: The value represents the measurement range when the sensitivity of input sensor is set to 5.1mV/(m/s2).
For velocity and displacement, the values represent the measurement range at input signal set to 156.7Hz (Velocity) and 70.5Hz (displacement).

Specifications of analog measurement

Input signal	4 to 20mA DC[6], 0 to 5V DC, 1 to 5V DC, 0 to 10V DC[6]
Measurement interval	1s
Data summary report	Base(interval 1 to 900s), hourly, daily, weekly, monthly and yearly reports
Calculating item	Average, max., min., measurement condition signal
Alarm criteria	Relative value alarm, variation value alarm, group alarm
Signal abnormality criteria	Abnormal measurement value

[6]: A signal conversion amplifier is additionally required.

Specifications of contact measurement

Input signal	Non-voltage a-contact (input current : 10mA, 12VDC)
Data summary report	Hourly report
Calculating item	Cumulative time, cumulative count
Alarm criteria	Relative value alarm

Online station

Item	Specifications
PC	CPU : Core 2 Duo or higher ; Memory : min. 2GB OS : Windows XP/Vista/7
Server	CPU : Xeon 2.66GHz or higher ; Memory : min. 4GB OS : Windows Server 2003/2008 DB : SQL Server 2005/2008
Display	Windows compatible display (XGA or higher)
Printer	Windows compatible printer

Web client

Item	Specifications
Web browser	Internet Explorer 6 or later
Display	Windows compatible display (XGA or higher)

Related vibration instruments

品名	Model	Specifications
Displacement-vibration conversion unit	MP-150	Input : displacement 2ch
Online vibrometer	MK-64	Input : vibration 1ch
Machine diagnosis instrument	MK-210HEⅡ	Portable instrument

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＊ Core 2 Duo and Xeon are trademarks of Intel Corporation or its subsidiary company.
＊ All specifications data contained in this catalog are subject to change without notice for product improvement.

NEW Online Machine Diagnosis System

Super CMS-10000

ISO14001
JQA-EM5074

The New World Classic –An Ever Evolving System–

SUPER CMS 10000

The online machine diagnosis system "CMS Series" has an excellent reputation from our customers.

JFE Advantech Co., Ltd.
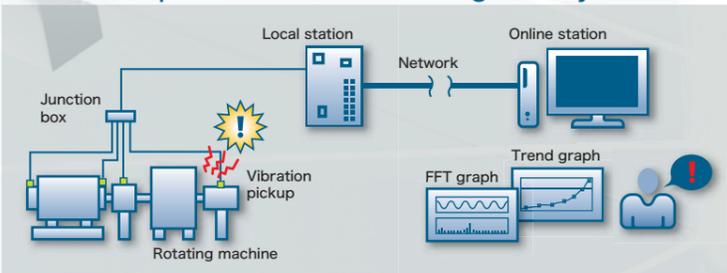formerly Kawatetsu Advantech Co., Ltd.

Super CMS-10000

Optimizing your machines to achieve efficient production and higher quality

Detects abnormality of facility earlier

Lengthens repair interval

Utilizes capaccity efficiently

Machine diagnosis system

Reduces inspection operations

Support facility improvements assess

Enhances quality

Online machine diagnosis system

Super CMS-10000 is a system that quantifies the status of plant facilities and detects abnormalities.
It contributes to maintenance and production activities as a tool essential for higher capacity utilization, quality improvement and maintenance cost optimization.
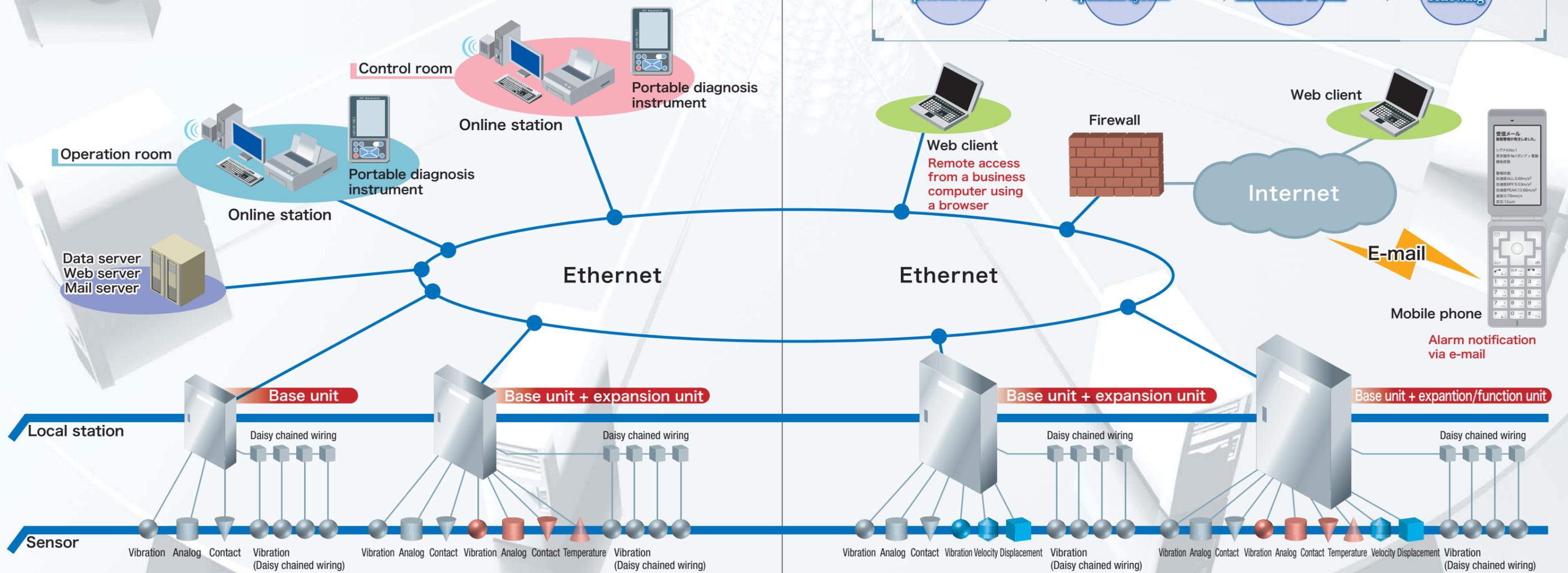
Basic concept of online machine diagnosis system

Local station • Network • Online station • Junction box • Vibration pickup • Rotating machine • FFT graph • Trend graph

Features

Automated vibration diagnosis of rotating machines	A fully automated system that automatically analyzes the cause of abnormality and outputs a diagnostic rerport.
Advnaced warning function	Early detection of abnormalities by newly developed judgment algorithm such as grouping ratio judgment in multiple machines.
Real-time vibration measurement	Measures and records the vibration behavior of the running facility in real-time to support post-event analysis and quality control.
Equipped with an advanced vibration analysis function	Equipped with functions such as multi-channel simultaneous FFT analysis, real-time FFT analysis and FFT graphic display with up to 51200 FFT resolution to enable sophisticated facility control.
Replete self-diagnosis function	By detecting sensor abnormalities (wire breaking, short-circuit, inverted connection, etc.), local station's abnormalities and network abnormalities, necessary information to maintain the diagnosis system is unified.
Multi-tab Interface	Using multi-tab interface,user can switch windows easily.
Correcting function of measured vibration values	Even to the facility that has variable spindle speed, correcting measured vibration values with using correlation comparison map enables to monitor the trend graph adequately.
Daisy chaining	Daisy chain connection of each vibration pickup enables reduction of the wiring cost.
Multi-language capability	Each user can freely select from display languages such as English and Japanese.
Expansion of local station	Satisfying the user's demand, adequate combination of units can be realized.

We provide comprehensive support from introduction to operation of the system through our accumulated experience and reliable technology.

Analysis of the present state → **Proposal of an optimum system** → **Introduction and installation of CMS** → **Effective-utilization following**

Control room

Online station

Portable diagnosis instrument

Operation room

Portable diagnosis instrument

Online station

Data server / Web server / Mail server

Web client
Remote access from a business computer using a browser

Firewall

Web client

Internet

E-mail

Mobile phone

Alarm notification via e-mail

Ethernet

Ethernet

Base unit

Base unit + expansion unit

Base unit + expansion unit

Base unit + expantion/function unit

Local station

Daisy chained wiring

Daisy chained wiring

Daisy chained wiring

Daisy chained wiring

Sensor

Vibration Analog Contact | Vibration (Daisy chained wiring)

Vibration Analog Contact Vibration Analog Contact Temperature | Vibration (Daisy chained wiring)

Vibration Analog Contact Vibration Velocity Displacement | Vibration (Daisy chained wiring)

Vibration Analog Contact Vibration Analog Contact Temperature Velocity Displacement | Vibration (Daisy chained wiring)

Super CMS-10000 System Blocks

We propose an optimum system that meets the customer's needs by summarizing the results of analyses about the problem of custmore's machines and the condition of the machines.

Online station/web client
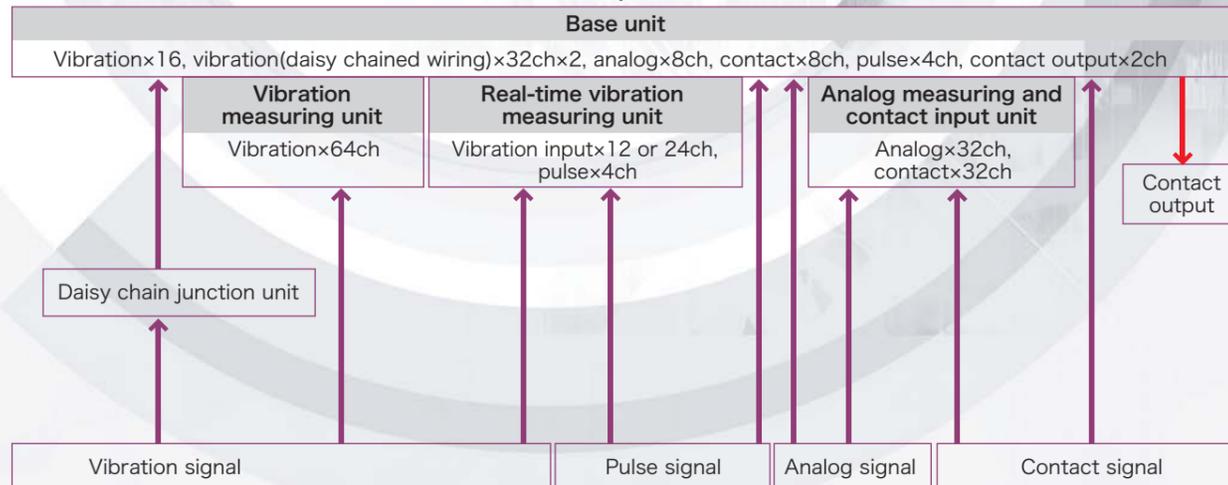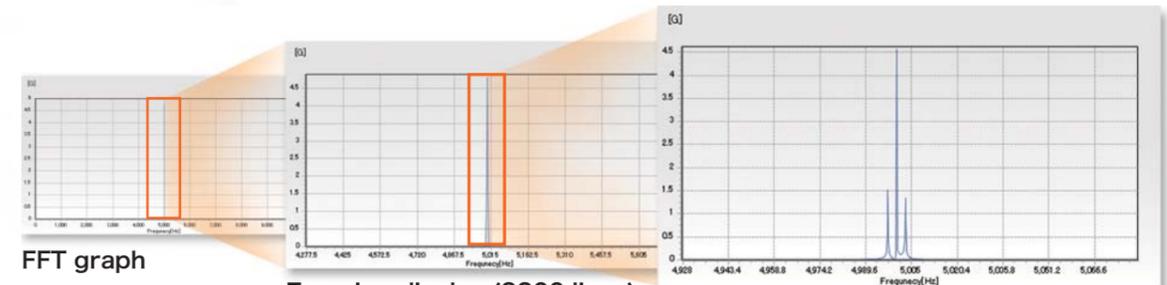
Basic component
- Facility configuration tree
- Measuring route configuration tree
- Alarm event list
- Utility
- Facility configuration list
- Measuring route list
- Automatic self-diagnosis event list
- Individual setting management
- Automatic alarm level setting
- Periodical data report
- Equipment drawing layout

Simple diagnosis by vibration
- Simple diagnostic report
- Measured level graph
- Deterioration forecast graph
- Trend graph
- Remaining life forecast
- Absolute value graph
- Off-line monitoring

Precise diagnosis by vibration
- FFT graph
- FFT history graph
- Precise diagnostic analysis
- Precise diagnostic report
- Diagnosis of bearings
- Diagnosis of gears
- Diagnosis of mechanisms
- Diagnosis of pumps and fans
- Diagnosis of motors
- Characteristic frequency monitoring

Equipment management logging
- Machine maintenance log
- Machine inspection log

Operation monitoring
- Cumulative operating time graph
- Cumulative ON frequency graph

Correlation comparison
- Correlation comparison graph

Equipment layout tool
- Equipment drawing layout editor

External contact output tool
- Alarm event output
- Abnormality event output

Navi-guide tool
- Registration of configuration and sentences

Portable instrument link tool
- Inspecting and measuring data upload

E-mail transmission tool
- Alarm event
- Automatic self-diagnosis event

Multi-language tool
- English, Korean
- Chinese, Japanese

Data export tool
- TEXT format output
- EXCEL format output

▭ …Option

Network
| Wired LAN | Optic LAN | Wireless LAN | ADSL modem |

Ethernet

Local station

Base unit
Vibration×16, vibration(daisy chained wiring)×32ch×2, analog×8ch, contact×8ch, pulse×4ch, contact output×2ch

Vibration measuring unit
Vibration×64ch

Real-time vibration measuring unit
Vibration input×12 or 24ch, pulse×4ch

Analog measuring and contact input unit
Analog×32ch, contact×32ch

Contact output

Daisy chain junction unit

| Vibration signal | Pulse signal | Analog signal | Contact signal |

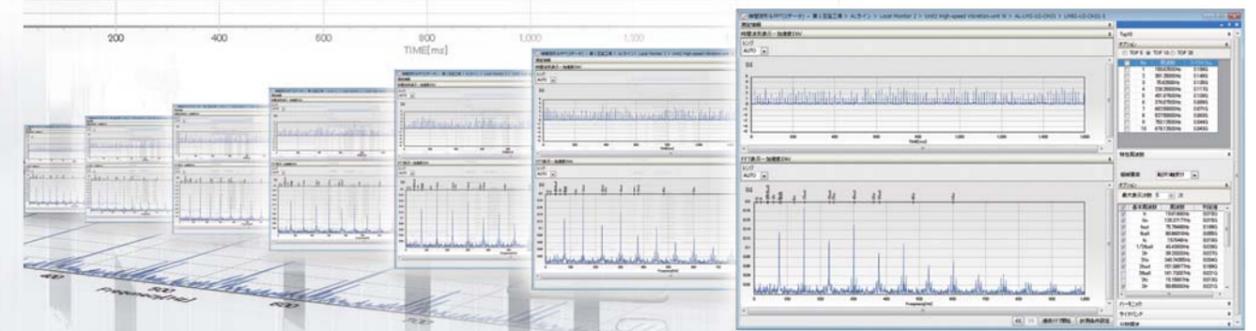## Highly resolutive FFT function up to maximum 51200 lines
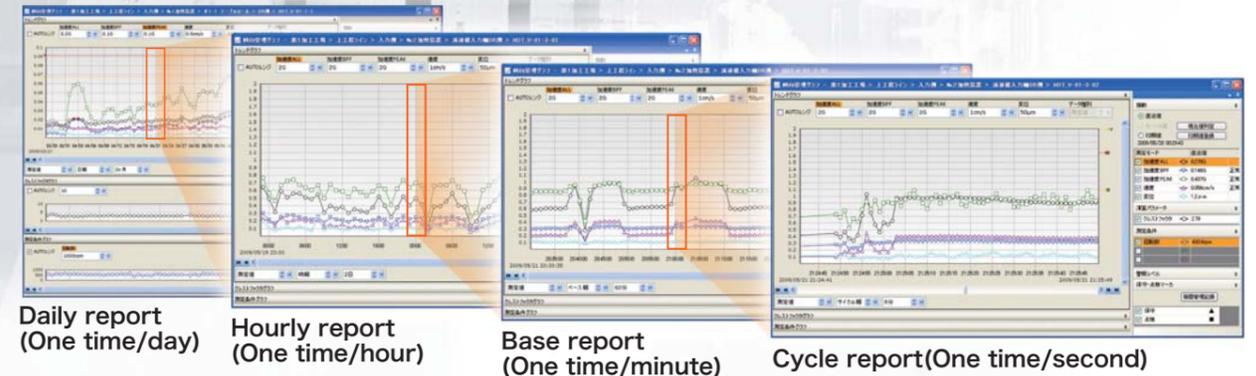
FFT graph

Zooming display (3200 lines)
In resolution of 3200 lines, sideband cannot be observed.

Zooming display (51200 lines)
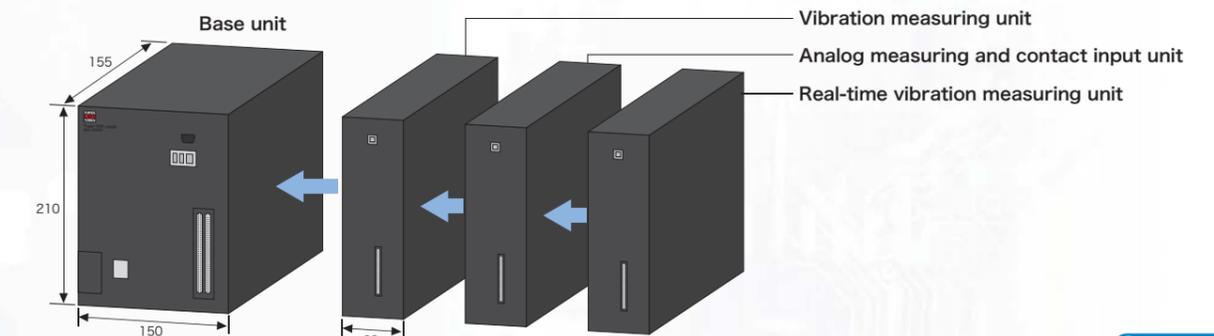In resolution of 51200 lines, sideband can be clearly observed.

Multi-channel simultaneous FFT function, real-time FFT function

Real-time measuring function

Daily report (One time/day)
Hourly report (One time/hour)
Base report (One time/minute)
Cycle report(One time/second)

Local station taht can be freely combined with units

Base unit

- Vibration measuring unit
- Analog measuring and contact input unit
- Real-time vibration measuring unit

155
210
150
60

Super CMS-10000 Software

SUPER CMS 10000

Basic component

A fully automated system that automatically analyzes the cause of inferiority and outputs a diagnostic rerport.
Multi-tab interface and panel display enable various monitoring information to be displayed on the screen.

Equipment drawing layout (detail)

Equipment drawing layout (part)

Equipment drawing layout (whole)

Displays the facility satus in a layout

Facility configuration tree
Displays facility configuration in tree format

Alarm event management
Displays alarm event information in a list

Main window

Measurement route tree
Displays input configuration of sensors in a tree format

Alarm details

Simple diagnostic report

Individual precise diagnostic report for machine element

Individual precise diagnostic report for equipment

Monthly report output

Alarm list output

Simple diagnosis by vibration

Supports simplified diagnosis of the facility and determination of the repair timing

Calculating conditions settings

Measured level graph

Trend graph

Results of automatic alarm level setting

Deterioration forecast graph

Remaining life forecast

Absolute value graph

Off-line monitoring

Precise diagnosis by vibration

Performs automatic diagnosis using a dedicated argorithm for each equipment type
・Fan/blower diagnosis ・Pump diagnosis ・Roll diagnosis ・Motor diagnosis ・Gear device diagnosis

FFT graph (detail)

FFT graph (multiple)

FFT history graph

Operation monitoring

Enables the user to display cumulative operation time and cumulative ON frequency of contact input signal

Cumulative operating time graph/ cumulative ON frequency graph

Correlation comparison

Enables the user to grasp critical speed and to correct ideally vibration values according to spindle speed by the correlation comparison between measured vibration values and spindle speed

Correlation comparison graph

Equipment management logging

Compiles inspection/repair history of equipment in a database

Equipment management logging

Navigation

Interactive interface for guidance

NAVIGATION   Comfirm the trend graph. If vibration value is rising up,investigate the reason by FFT graph.

Navigation bar

Facility layout configuration tool

Enable the user to freely configure the facility layout

Facility layout editor

Portable instrument link tool

Links with a portable diagnostic instrument

MK-210HEⅡ data processing software

Poratble diagnosis instrument

Trend graph

External contact output tool

Contact output

Mail transmission tool

Mail transmission

Multi-language tool

English Korean Japanese Chinese

Multi language

Data export tool

CSV xls

Data export

…Option