NoiseKen ®

EMISSION MEASUREMENT SYSTEM FOR PCB

EMC PRECISION SCAN

EMC Precision Scan System >>>>>>>>>>

for Microsoft® Windows® XP

EPS-3000

NOISE LABORATORY CO., LTD.

NoiseKen®
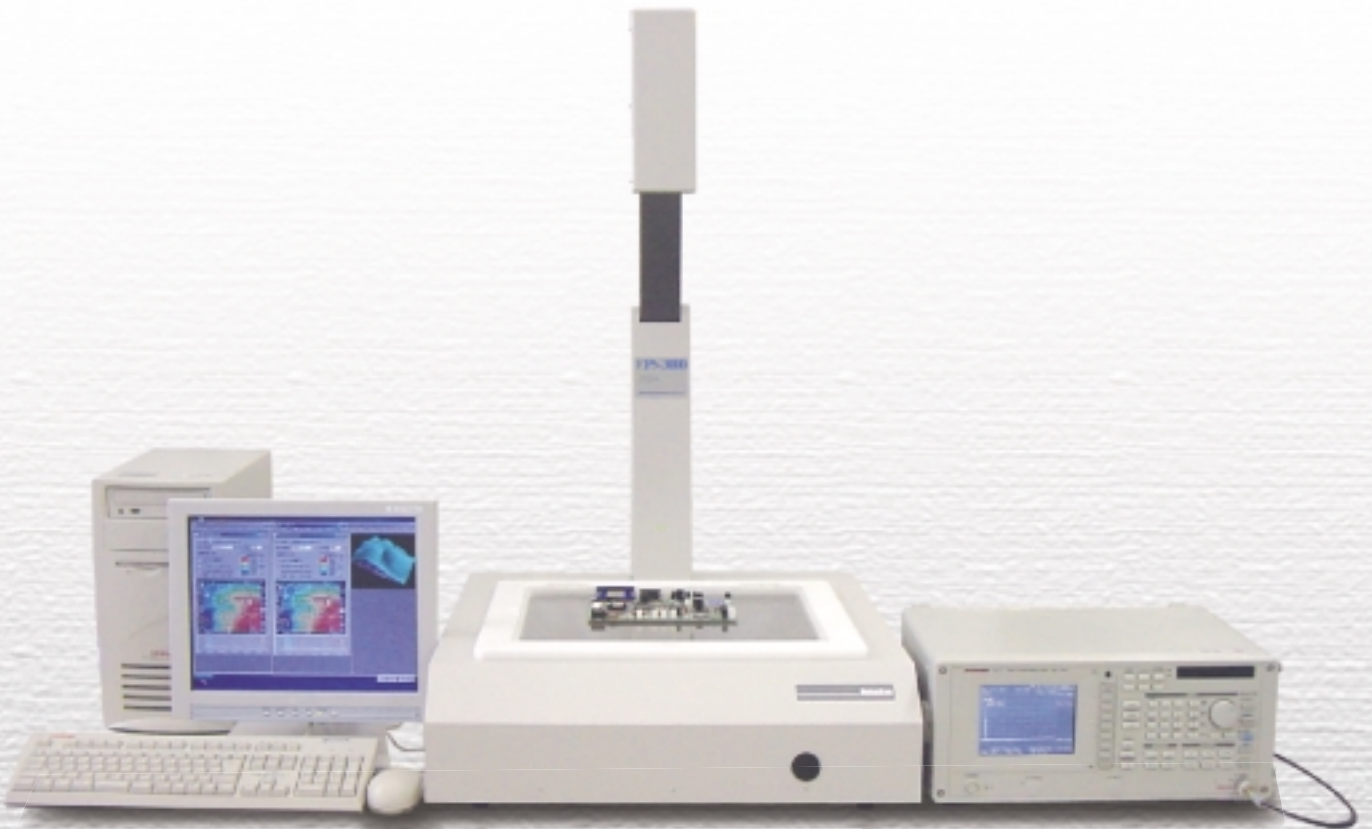
● **EMC PRECISION SCAN SYSTEM** ●
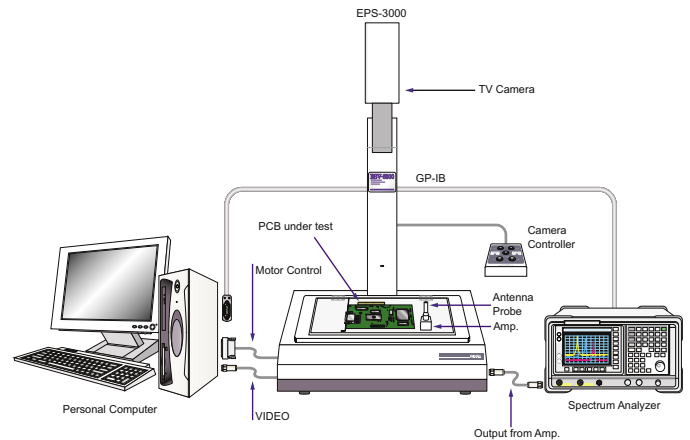
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Today, the digital devices are incorporated in every facet of our social system worldwide. As a result, the electromagnetic interference causes various troubles and accidents, has become a major social problem. As a matter of course, the regulations against emissions have become stricter than ever in the communication, homo-electronics, and automotive industories. Under such circumstances, obviously many engineers and personnels in charge of product development spend considerable time and effort in taking measures to reduce emssions. In order to help you solve these problems, NOISE LABORATORY has developed "EMC PRECISION SCAN SYSTEM", a completely new engineering tool to effectively incorporating solutions into equipment in question at the designing stage, offering near field measurements for printed circuit boards, and other electronic parts and wirings. This innovative "EMC PRECISION SCAN SYSTEM" cuts "Time" and "Labor" required to cope with emission problems by providing a number of outstanding features:

● **SYSTEM CONFIGURATION**

EPS-3000
TV Camera
GP-IB
PCB under test
Camera Controller
Motor Control
Antenna Probe Amp.
Personal Computer
Spectrum Analyzer
VIDEO
Output from Amp.

Measurement Frequency Range is 150kHz to 3GHz (Optionally available) Zoom function and 3D Graphical Representation to localize and identify emission sources
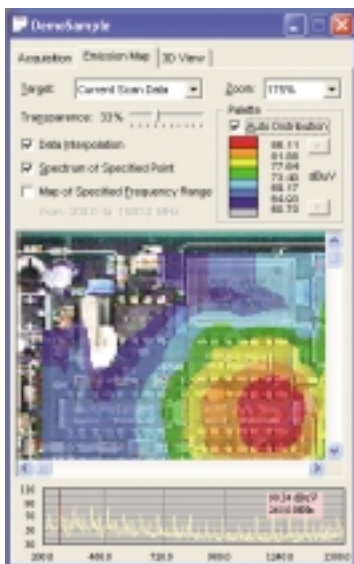
4 various portraits are provided. (Wide, Standard, Zoom and Super Zoom.) Zoom capability, for example, realizes pin to pin distinction.
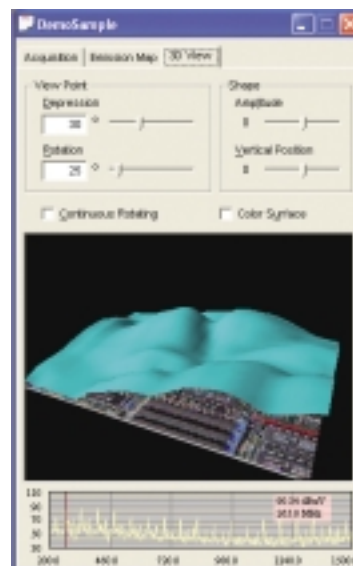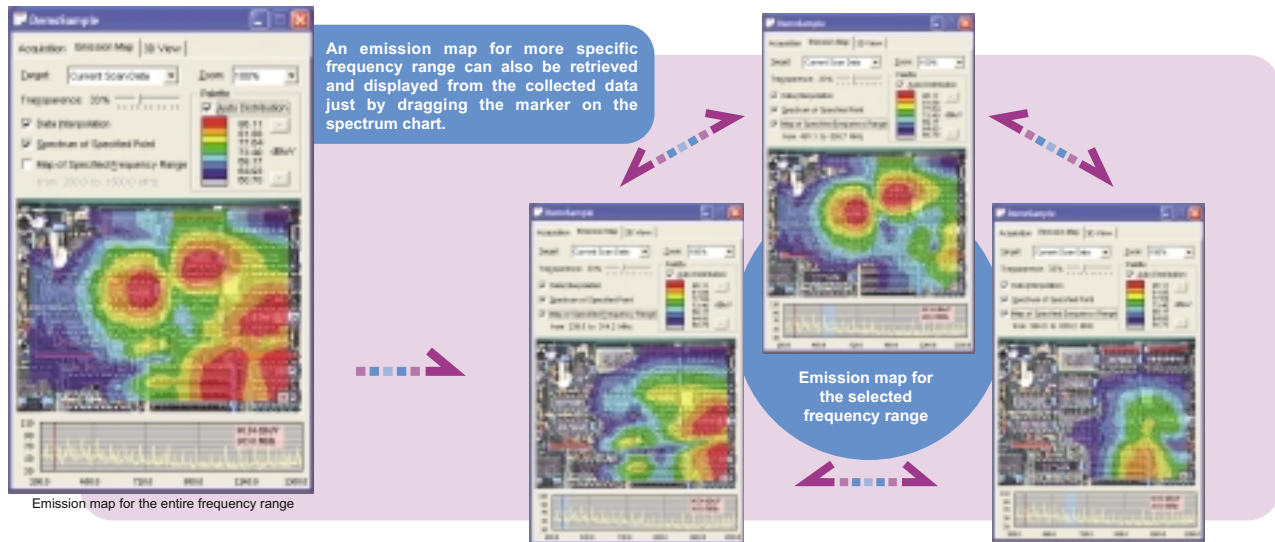

With the "3D View" function, a field intensity distribution is represented graphically. The higher the intensity, the higher the altitude. This 3D graphic rotates for easier identification.

COMPOSITE DISPLAY OF EMISSION MAP AND PCB PICTURE

Completed emission spectrum analysis (CESA) realizes that the frequency spectrum charts acquired for each position of the antenna probe are stored for the entire scanned area.

The system enables the user to identify the potential emission problem areas on the printed circuit board at a glance.
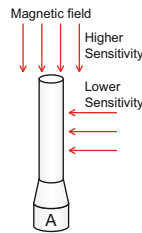
An emission map for more specific frequency range can also be retrieved and displayed from the collected data just by dragging the marker on the spectrum chart.

Emission map for the entire frequency range

Emission map for the selected frequency range

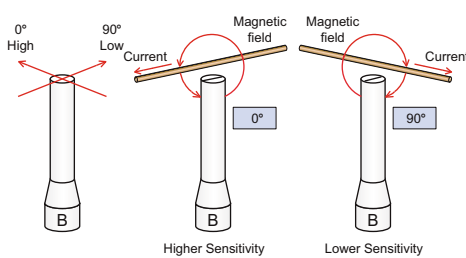## ELECTRIC FIELD PROBE AND MAGNETIC FIELD PROBE
Selective use of either type is indispensable for near field measurements

- Magnetic field antenna probe (2 types) and Electric field antenna probe (1 type) are provided as standard accessories. The magnetic field probes have a different directivity.
- EPS-3000 is designed to mechanically scan with a single probe, allowing the user to freely set the scanning resolution
- An advantage over the antenna array type instrument is that there is no measurement error originating from antenna to antenna difference, which is inherent with the antenna array type
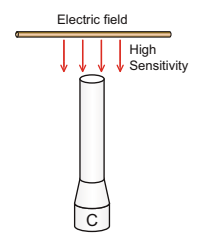
- Directivity of Probe A (for vertical magnetic field)

Magnetic field

Higher Sensitivity

Lower Sensitivity

A

- Directivity of Probe B (for horizontal magnetic field)

0° High

90° Low

Current

Magnetic field

0°

B

Higher Sensitivity

Magnetic field

Current

90°

B

Lower Sensitivity

- Directivity of Probe C (for vertical electric field)

Electric field

High Sensitivity

C

- **Example of electric field measurement: the board under test is radiating high frequency electric fields.**

Magnetic field probe may not detect electric component of the fields. In the near field, the field produced is mostly a function of the properties of the source. It is important, therefore, that the user can selectively choose the magnetic or the electric probe.
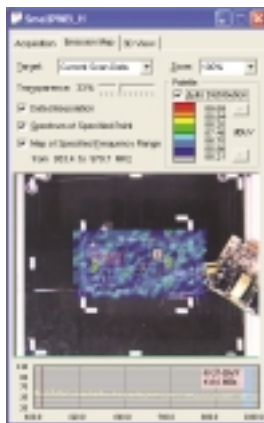
①**The magnetic field probe measurement**
The magnetic field probes cannot sometimes detect the relatively high levels of radiation from an LSI itself, requiring countermeasures.
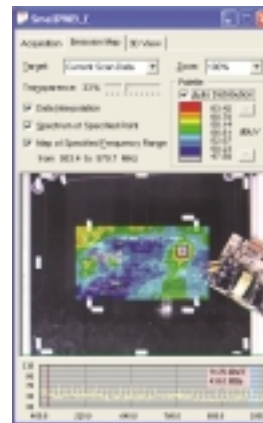
②**The electric field probe measurement**
An LSI may be located at the strongest intensity source. Incorporating proper measures into the surroundings of this LSI will reduce radiation

MEASUREMENT PROCEDURE & MEASUREMENT EXAMPLE

Starting the System

Selecting an antenna probe and a spectrum analyzer

● Select an antenna probe from the three standard probes provided.
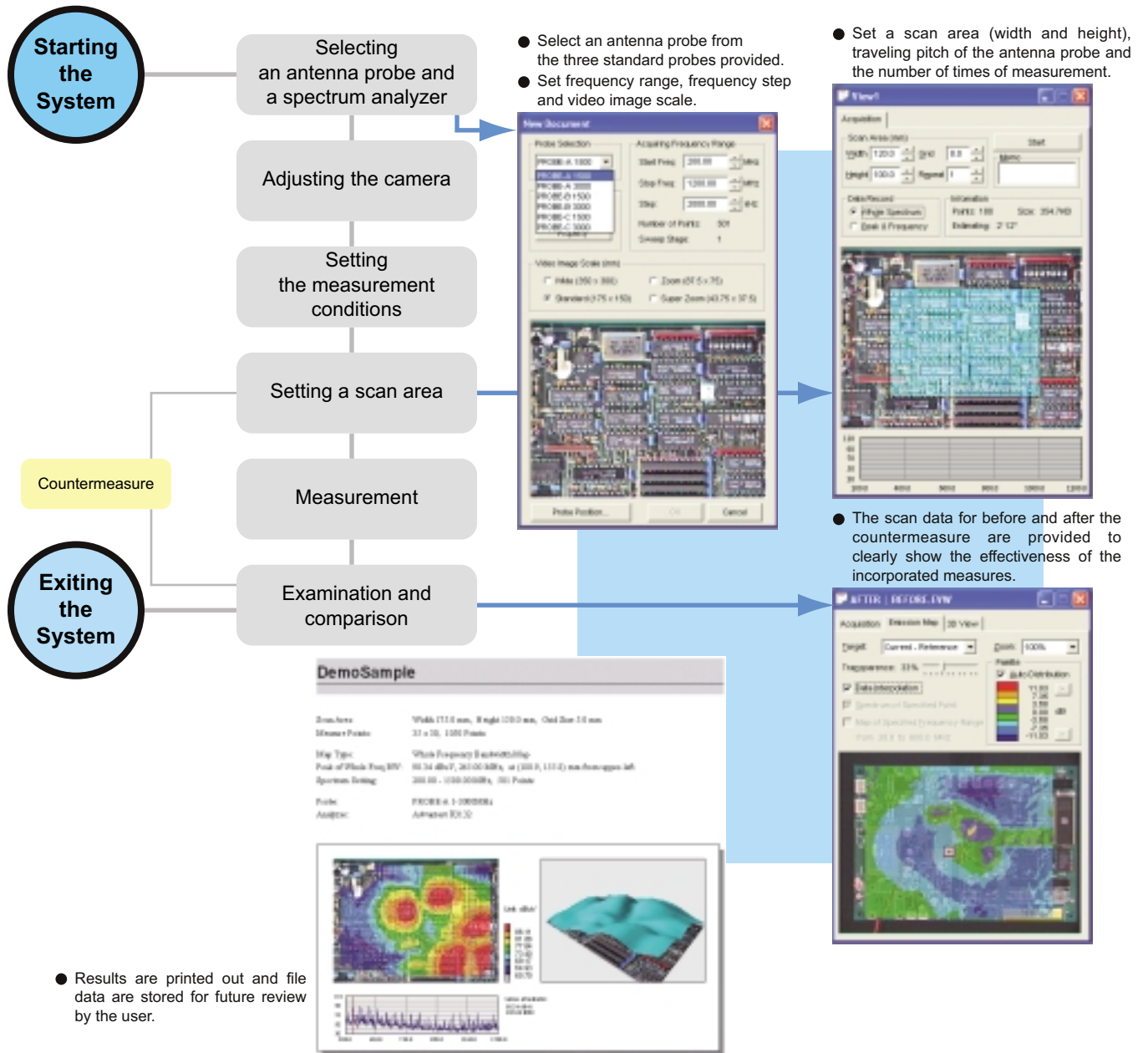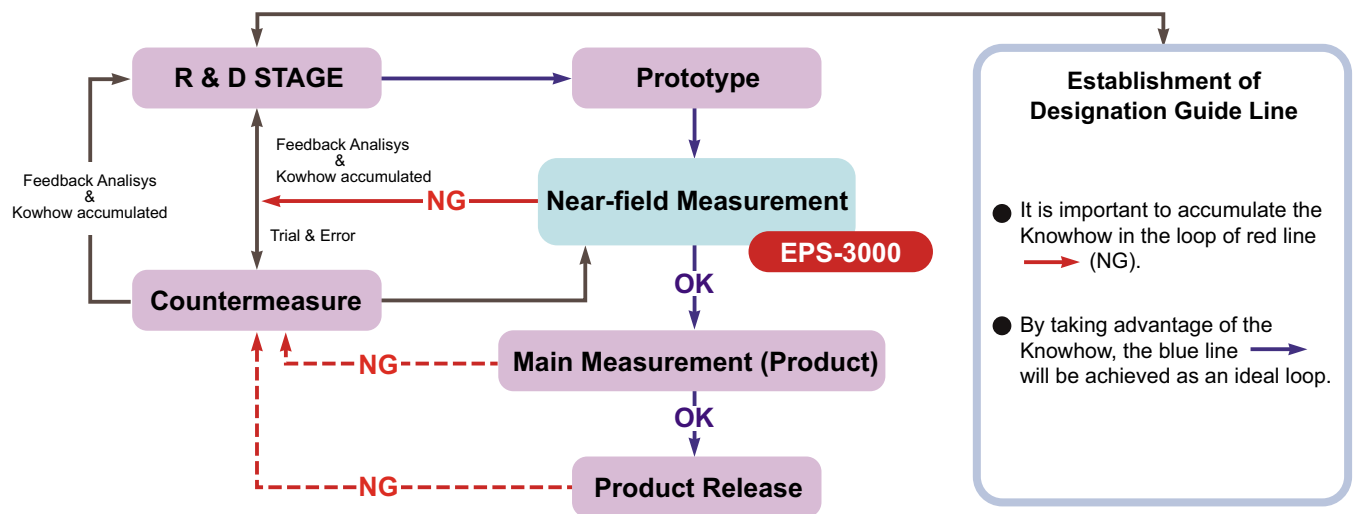● Set frequency range, frequency step and video image scale.

● Set a scan area (width and height), traveling pitch of the antenna probe and the number of times of measurement.

Adjusting the camera

Setting the measurement conditions

Setting a scan area

Countermeasure

Measurement

Exiting the System

Examination and comparison

● The scan data for before and after the countermeasure are provided to clearly show the effectiveness of the incorporated measures.

DemoSample

● Results are printed out and file data are stored for future review by the user.

● Purpose & Orientation of the Emission Measurement

R & D STAGE → **Prototype**

Feedback Analisys & Kowhow accumulated

Feedback Analisys & Kowhow accumulated

Trial & Error

NG ← **Near-field Measurement**

EPS-3000

Countermeasure

OK

----NG---- **Main Measurement (Product)**

OK

----NG---- **Product Release**

Establishment of Designation Guide Line

● It is important to accumulate the Knowhow in the loop of red line → (NG).

● By taking advantage of the Knowhow, the blue line → will be achieved as an ideal loop.

● MAIN UNIT/CONTROLLER

Parameters	Specifications
Scanning method	Scanning of micro-electromagnetic field probe by XY stage
Analysis of detection signal	Analysis using spectrum analyzer
Frequency response	30MHz~1.5GHz (Option: ~3GHz)
Low frequency response	150kHz~100MHz (Option)
Control method	Control by personal computer GP-IB interface, Pulse Motor Control, Image Control
Scanning Area	300 (Length) x 350 (Width) mm maximum
Scanning Resolution	1.0mm x 1.0mm (depending on an antenna probe)
Minimum Scanning Step	1.0mm or more/0.1mm step (Minimum travel step of antenna probe)
Operating Power Supply	AC95~120/210~250V 50/60Hz 150VA
Operating temperature & humidity	15~35℃, 25~75%RH (No condensation shall occur.)
Dimensions (WxHxDmm)	601 x 980 x 662 (Main Unit)
Weight	Approx. 37kg (Main Unit)

● PERSONAL COMPUTER (REQUIRED SPECIFICATIONS)

Parameters	Specifications
Compatible machine	IBM PC-AT compatible machine running the Windows® XP Recommended CPU: Pentium® II 233MHz or higher Main memory: 128MB or more HDD: 100MB or more (depending on scanning data quantity) Display mode: SVGA or XGA
Operating System	Microsoft® Windows® XP
Software	DirectX® 2.0 or later version required for 3D display
Expansion Slot	PCI Bus 3 slots
Expansion board	GP-IB Board (Using IRQ) Pulse Motor Coltrol Board (Not using IRQ) Video Board (Using IRQ) ● The display board of the PC must be operating with Direct Draw overlay.

● MEASURING FUNCTION

Measurement Unit	Level: dBm, dBμV (Switchable) Frequency: MHz (Linear scale)
Compatible spectrum analyzer	Agilent Technologies: HP8591E/ESA-L1500A/E440X etc. ADVANTEST: R3131/R3132/R3261C etc. Anritsu: MS2601B/MS2651A,B etc.