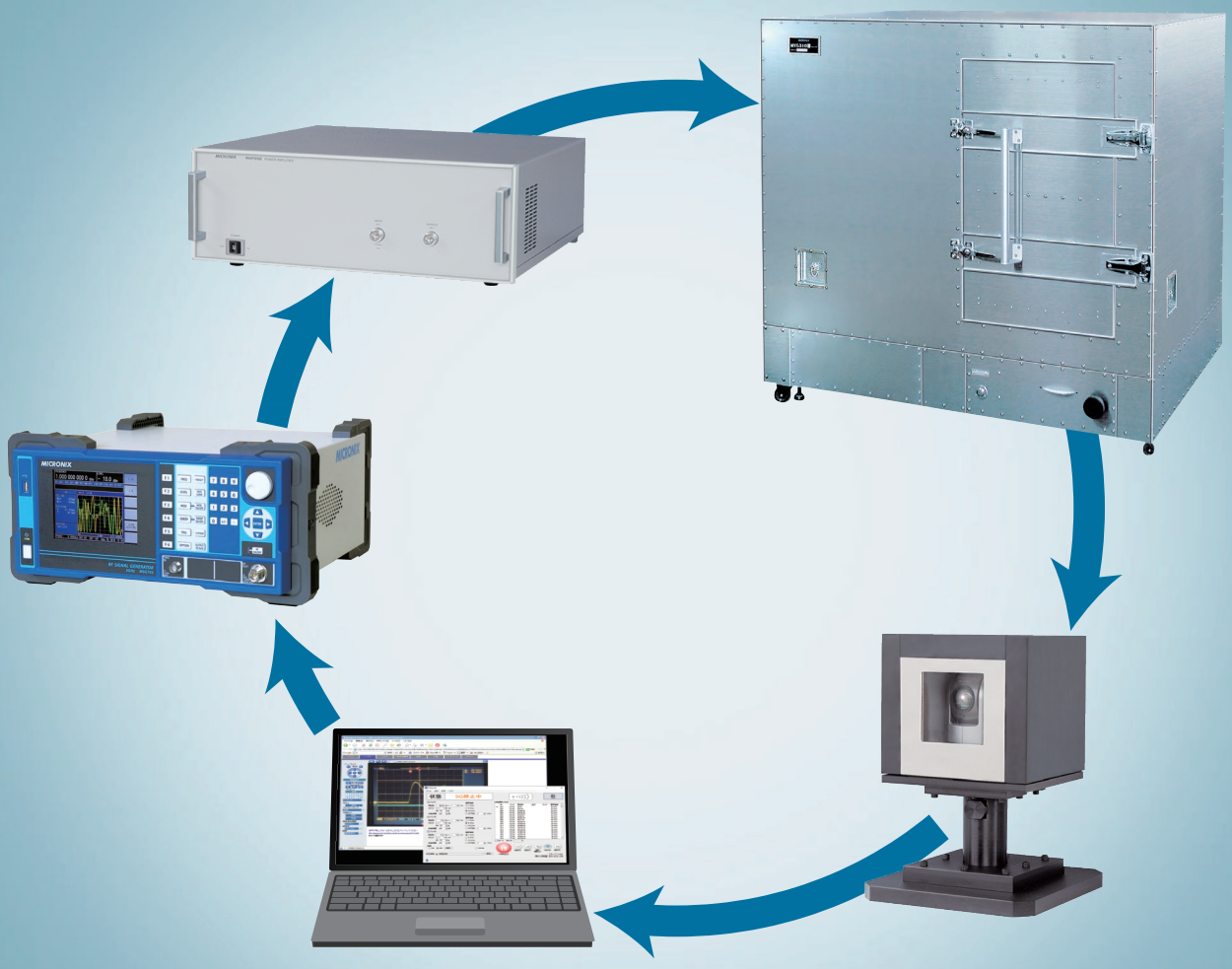
C & U
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MICROWAVE

EMS Test System

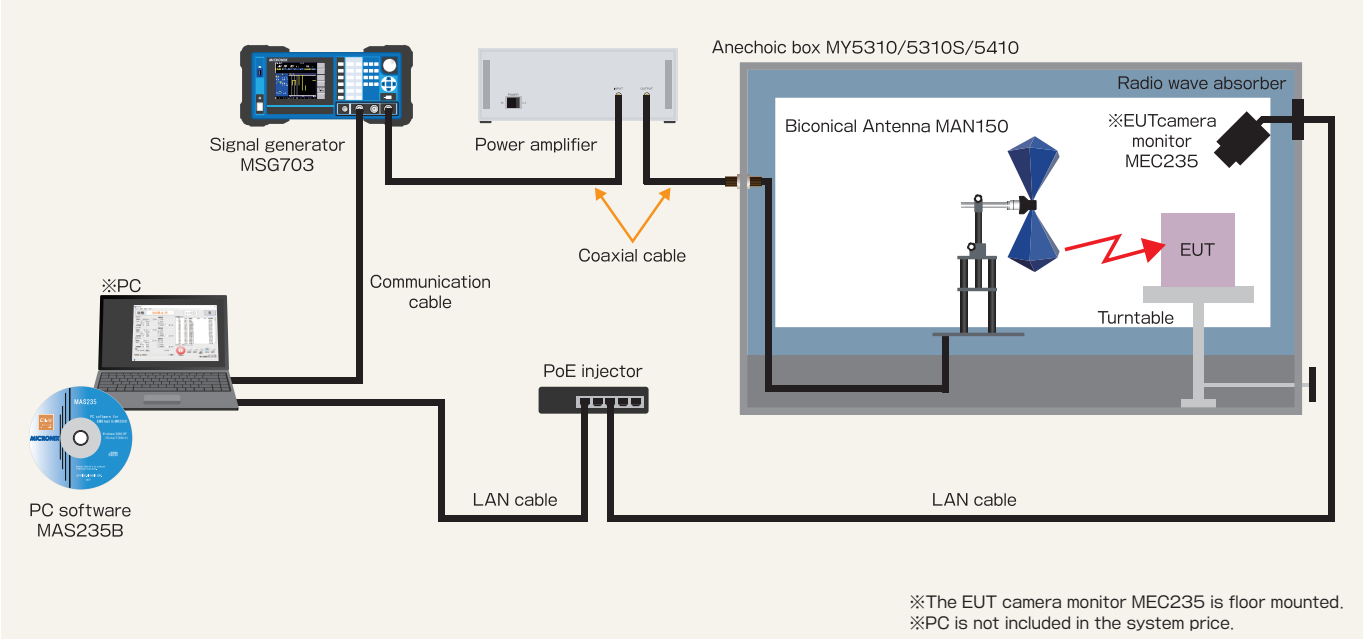
# MR2350

## Compact and easy-to-use EMS total test system
## -Precompliance-



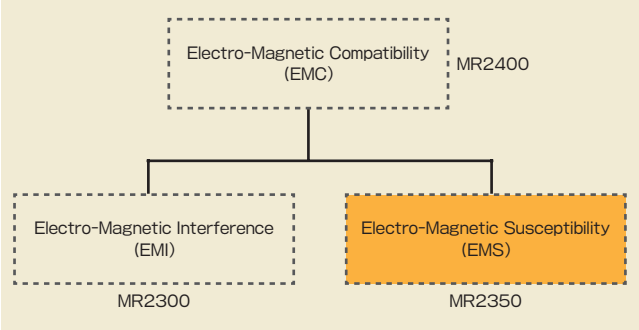
MICRONIX

## Outline of MR2350




※The EUT camera monitor MEC235 is floor mounted.
※PC is not included in the system price.

## About EMS test




EMC test consists of EMI and EMS tests. As for EMI test, it is evaluated whether the radiated emission or the conducted emission discharged from EUT (Equipment Under Test) exceeds the limit value set beforehand. This limit value is used to guarantee that the EUT operation doesn't give a remarkable disturbance to operation of other equipment and wireless communication. The emission test described above can be done by the EMI test system MR2300.
On the other hand, it is evaluated in the EMS test whether the EUT causes the malfunction by a peripheral electromagnetic wave. This radiation immunity test can be done with the precompliance EMS test system MR2350 described in this catalogue. The malfunction of the EUT can be observed on the PC screen through the EUT camera monitor put in the anechoic box. Of course, the EUT should be an equipment whose malfunction can be visually judged such as an equipment with LED or LCD.

### EMI+EMS test system MR2400

The system combining the EMI test system MR2300 and the EMS test system MR2350 is the EMC test system MR2400. The PC software is MAS440/540.
The price of MR2400 becomes much lower than purchasing MR2300 andMR2350 separately because the anechoic box MY5310/5310S/5410 and the broadband antenna MAN101/102 are common to two systems.

## Features of MR2350

### 1 Electric field strength of 1, 3, 10V/m

The electric field strength of 1, 3, 10V/m and moreover optionally 1 to 10V/m can be generated.

### 2 Mulfunction detection by EUT camera monitor

The malfunction of the EUT by the electromagnetic radiation can be observed by a camera put in the anechoic box. The image is displayed on the PC screen.

### 3 EMI+EMS test by MR2400

MR2400 combining the EMI test system MR2300 and the EMS test system MR2350 makes the EMC (EMI+EMS) test possible.

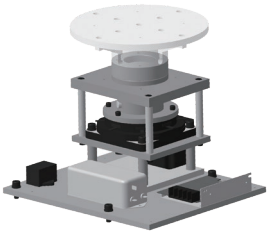
### 4 Whole system controlled with one PC

One PC controls all of applications such as the EMI test, the EMS test, the EUT camera monitor and the electric turntable (option).

### 5 Electric turntable (factory option)

This option is an electric turntable of 220mm in diameter and 15kg in load. And this is controlled by the PC.

※ This can be applied to the EMI test system MR2300 as well.
MAS20T and MAS430T/530T are lined up as PC software.



## Power amplifier MAP202



MAP202 is a power amplifier of gain approximately 45dB and frequency range 80 to 1000MHz. The input damage level is +20dBm. MAP202 amplifies the signal from the signal generator MSG703 and then supplies it to the broadband antenna.
In addition, MAP202 is applied only to the anechoic box MY5310/5310S.

## Anechoic box MY5310/5310S/5410



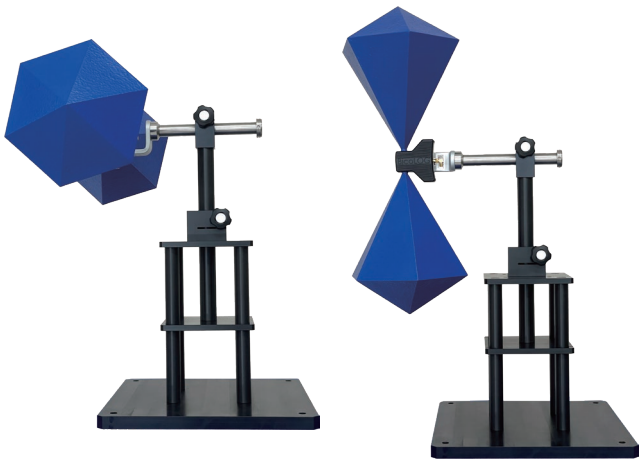
MY5310



MY5410

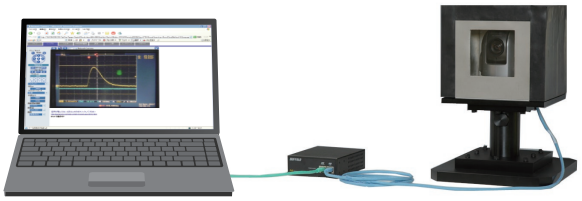
The anechoic box is necessary not to leak the high power electromagnetic wave radiated by the antenna outside.
MY5310/5310S/5410 utilize ferrite tiles as radio wave absorbers, demonstrating absorption performance of over 20dB between 30MHz and 400MHz, and over 12dB between 400MHz and 1GHz. As a result, unnecessary reflections and resonances within the box are suppressed.
Additionally, it is equipped with a turntable with a diameter of 220mm and a load capacity of 10kg. The turntable can be rotated using an externally mounted rotary knob. It also features a rotation indicator, allowing precise setting of the rotation angle. Alternatively, an electric turntable is available as an option in place of this manual turntable. Furthermore, it is equipped with a power outlet, D-sub connector, LAN connector, and N-type coaxial connector.
MY5410 is an anechoic box for a large EUT and with the turntable of 756mm in diameter and 100kg in load. As for the broadband antenna, MAN102 is installed. Moreover, the antenna can be moved up and down in maximum 90cm width each 10cm by hand with the antenna trestle installed. The radio wave absorber is the same one as MY5310.

## Broadband antenna MAN150

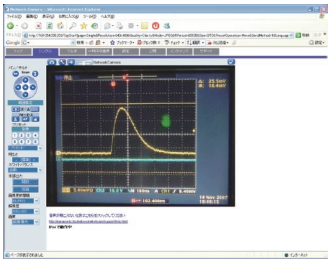


The MAN150 is a compact biconical antenna that supports frequencies from 20MHz to 3GHz Using a dedicated antenna stand, users can manually switch between horizontal and vertical polarization. Additionally, the height can be adjusted.

## EUT camera monitor MEC235



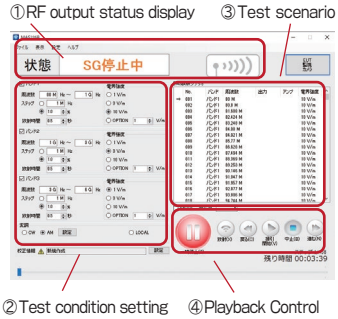
MEC235 is a camera to observe the malfunction of the EUT caused by the electromagnetic radiation. The EUT should be such an equipment as the malfunction can be visually judged. Because of being put in the anechoic box, the main body of camera is covered with the radio wave absorber (ferrite tile) and the pedestal is made of plastic. Therefore, the unnecessary reflection by the camera are suppressed. The camera can be zoomed up to 42 times, and the view range can be controlled within ±29°on the right and left, up to 23°upward and up to 35° downward.



This control can be done with the PC, and the image is displayed on the PC screen. The right picture is an example of the digital oscilloscope screen taken with MEC235. In addition, the power source of the camera is supplied through LAN cable from the PoE injector.

## PC software MAS235B

### ① RF output status displa




This displays the output status of the signal generator (SG).
When the RF output of SG is on, [SG is outputting] is displayed, and when it is off, [SG is stopped] is displayed.

### ② Test condition setting

Set the conditions for creating test scenario data.It can be up tp 3 band settings and modulation method.
The sweep frequency range is specified by the start frequency and stop frequency. The sweep step has a frequency step and a ratio step, the former sweeps at a specified frequency step (1kHz to 100MHz) at equal intervals, and the latter sweeps at a specified ratio (0.1 to 20%). For example, if the start frequency is 80 MHz in 10% steps, the sweep will be 80, 88, 96.8 MHz....Specify the interval (0.1 to 20 seconds) from the start of RF output to the stop of each step in the emission time.
The electric field strength is basically set to either 1, 3 or 10 V/m, but it can be set arbitrarily within the range of 1 to 10 V/m for each band.
Select the modulation method from CW or AM modulation.

### ③ Test scenario

The calculated test scenario is displayed from the set test conditions, power amplifier settings, and field strength calibration information.

### ④ Playback Control

You can start and pause the scenario, radiate at any position, stop the test, and move the playback position. By the way, there are two types of sweeps: single sweeps and repeated sweeps (repeats).
Below the operation section, the total number of steps in the scenario and the number of steps at the playback position are displayed.
It also shows the time remaining when the scenario is played to the end.

## Specifications

### System specifications

| | |
|---|---|
| **Test frequency range** | 80 to 1000MHz |
| **Electric field strength** | 1, 3, 10V/m and option (1 to 10V/m, 1V/m resolution) |
| **AM modulation** | |
| **Waveform** | Sine wave |
| **Depth** | 80% and option (0 to 90%, 1% resolution) |
| **ON/OFF** | Available |
| **Sweep mode** | |
| **Frequency generation** | Fix, Sweep |
| **Resolution @ Fix** | 1kHz |
| **Step of sweep** | Frequency step : 1kHz to 100MHz, 1kHz resolution<br>Ratio step : 0.1 to 20%, 0.1% resolution |
| **Step time** | 0.1 to 20 sec, 0.1 sec resolution |
| **Sweep method** | Single, Repeat |
| **EUT malfunction detection** | By EUT camera monitor MEC235 |
| **Anechoic box supported** | MY5310, MY5310S, MY5410 |
| **Accessories** | ・N(P)/N(P) 1.5m coaxial cable(1pc.)<br>・N(P)/N(P) 1m coaxial cable(1pc.)<br>・USB cable(1pc.)<br>・Operating manual(1pc.) |

### Power amplifier MAP202 (Used with the exception of anechoic box MY5410)

| | |
|---|---|
| **Frequency range** | 80 to 1000MHz |
| **Gain** | 46dB typ @ 80 to 600MHz<br>44.5dB typ @ 600 to 1000MHz |
| **1dB compression level** | 42.5dBm typ @ 80 to 600MHz<br>41dBm typ @ 600 to 1000MHz |
| **Input VSWR** | Less than 2.0 |
| **Output VSWR** | Less than 5.5 |
| **Maximum input level** | +20dBm |
| **Modulation output** | 50Ω |
| **Input/Output connectors** | N (J) @ INPUT, OUTPUT |
| **Power supply voltage** | 100 to 240VAC, 50 to 60Hz |
| **Power consumption** | Approx. 80VA @ maximum output |
| **Dimensions** | 430(W)×150(H)×440(D)mm (excluding projections) |
| **Weight** | Approx. 10kg |

### Anechoic box MY5310/5310S/5410

| Model | MY5310-F1 | MY5310S-F1 | MY5410-F1 |
|---|---|---|---|
| Outside Dimensions (W×H×D) | 1340×1210×1030mm | 1350×1220×1080mm | 2364×1902×1424mm |
| Inside Dimensions (W×H×D) | 1280×960×960mm | 1280×960×960mm | 2215×1485×1275mm |
| Door opening dimensions(W×H) | 410×710mm | 510×920mm | 940×1440(H)mm |
| Weight | 400kg | 400kg | 1020kg |
| Turntable dimensions | φ220mm | φ220mm | φ756mm |
| Turntable load | 10kg in load | 10kg in load | 100kg in load |
| Shielding Characteristics | 70dB typ@2.2GHz | | 65dB typ@2.2GHz |
| Radio wave absorber | single-layer ferrite tile | | |
| Reflection Loss | ・ more than 20dB@30MHz to 400MHz<br>・ more than 12dB@400MHz to 1GHz | | |
| Coaxial connector | N(J)×1(Front left bottom for antenna)<br>N(J)×1(Right side bottom) | | N(J)×2(Left side bottom)<br>N(J)×1(Front right bottom for antenna) |
| I/F | D-sub25pins×1(female)<br>LAN×1<br>AC×1(250Vmax/10A)<br>※When electric-powered turntable is attached, AC100V | | |

※Dimensions and weight are approximate. Excluding casters and projections

### Broadband antenna (MAN150)

| | |
|---|---|
| **Frequency range** | 20MHz to 3GHz |
| **Polarization** | Linear |
| **Impedance** | 50Ω (nominal) |
| **Antenna type** | Biconical antenna |
| **Gain** | -45dBi to +1dBi(nominal) |
| **Antenna factor** | 20 to 51dB/m |
| **Connector** | SMA(J) |
| **Weight** | approx.350g |

### EUT camera monitor MEC235

| | |
|---|---|
| **Image compression method** | JPEG、MPEG-4 |
| **Resolution** | 640×480、320×240、192×144ドット |
| **Zoom** | 42times/12stages (21times @ optical, twice @ digital) |
| **Pan** | ±29° |
| **Tilt** | 23° @ upward, 35° @ downward |
| **Illuminance range** | 2 to 100,000 lx<br>0.09 to 100,000 lx @ color night view |
| **Radio wave absorber** | Ferrite tile and absorption seat<br>※Pedestal is made of plastic. |
| **Interface** | LAN(100BASE-TX/10BASE-T) |
| **Power supply** | Supplied from PoE injector |
| **Power consumption** | Approx. 5W @ waiting, approx. 9W@ pan scan |
| **Dimensions** | Camera part : 210(W)×190(H)×180(D)mm<br>Pedestal : 230(W)×200(D)mm<br>Total height : 342mm |
| **Weight** | Approx. 5.7kg (including pedestal) |
| **Accessories** | ・PoE injector and accessories (1 set)<br>・LAN cable (3 pcs.)<br>・Operating manual (1 pc.) |

### PC software (MAS235B)

| | |
|---|---|
| **Recommended PC** | More than Corei 5-440, Memory:more than 8GB,<br>HD remainder capacity:more than 100MB,<br>Communication:port USB |
| **Providing media** | CD-ROM |
| **OS** | Windows 8.1, 10(64bit) |
| **Web browser** | Since Internet Explorer 6.0(for MEC235) |

### Others

| | |
|---|---|
| **Operating temperature** | 0 to 40℃(guaranteed at 23±10℃) |
| **Operating humidity** | Less than 40℃/80%RH(guaranteed at less than33℃/70%RH) |
| **Storage temperature** | -20 to 60℃, less than 60℃/70%RH |
| **Options** | Electric turntable (factory option) |

※MICRONIX Corporation reserves the right to make change in design, specification and other information without prior notice.


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