

KG



**Audio Analyzer
AM/FM Signal Generator**

MAS-8400 series

Trustworthy Brand

MEGURO

Freely customize measurements with software control

The MAS-8400 series combines the functions of an audio analyzer with an AM/FM signal generator, and you can choose from three models according to your application. This product pursues high-speed measurement, space saving, energy saving, and low cost for production sites.



Audio Analyzer
Signal Generator

MAS-8401OSC
MAS-8401



Audio Analyzer



MAS-8410OSC
MAS-8410



Signal Generator



MAS-8421

Audio analyzer + AM/FM signal generator — Audio Analyzer Signal Generator

- The functions of the two models are consolidated into one. Contributing to lower capital investment costs.
- Compact design with a height of 100 mm and a weight of 6 kg. Space saving at the production site is realized.
- Car navigation system and car audio inspection functions are installed in one unit.

Audio analyzer — Audio Analyzer

- The adoption of FFT and the automatic range of high-speed switching contribute to shortening the inspection tact.
- Equipped with spectrum display function that can also be used for evaluation applications.

AM/FM signal generator — Signal Generator

- A wide output level range (-20 to 132dBμV EMF * option) provides one rank higher performance.
- Internal modulation frequency can be set in 1Hz increments for various job conditions.
- High-speed response contributes to shortening inspection tact

Main Functions

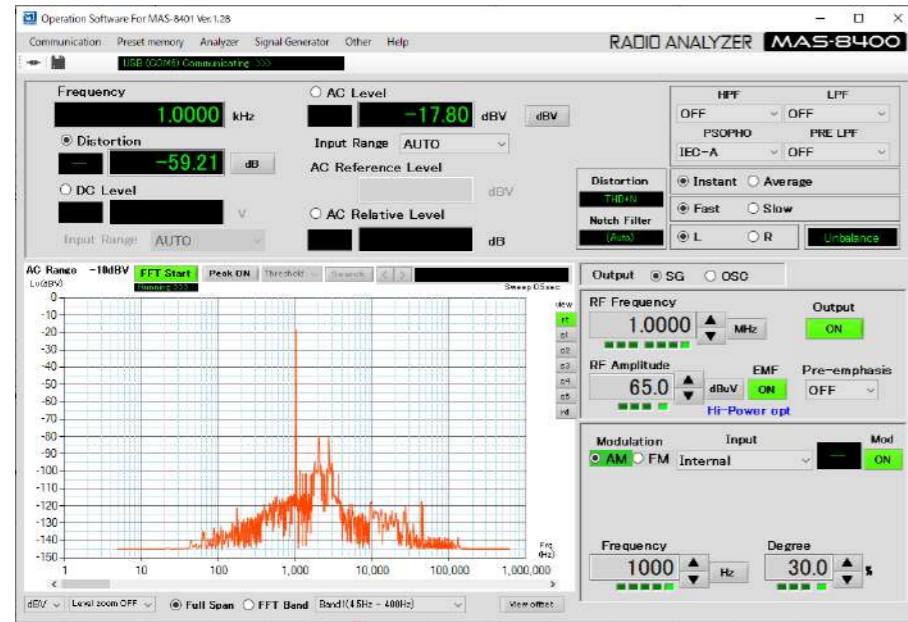
		MAS-8401OSC	MAS-8401	MAS-8410OSC	MAS-8410	MAS-8421
Measurement section	DC voltage measurement	●	●	●	●	—
	AC voltage measurement	●	●	●	●	—
	Distortion measurement	●	●	●	●	—
	Frequency measurement	●	●	●	●	—
Oscillator section	OSC	●	—	●	—	—
SG section	RF signal output	●	●	—	—	●
	FM modulation	●	●	—	—	●
	FM stereo modulation	●	●	—	—	●
	AM modulation	●	●	—	—	●

CONTROL

The MAS-8400 series sets numerical values during inspection, operation and obtain measurement results through the software.

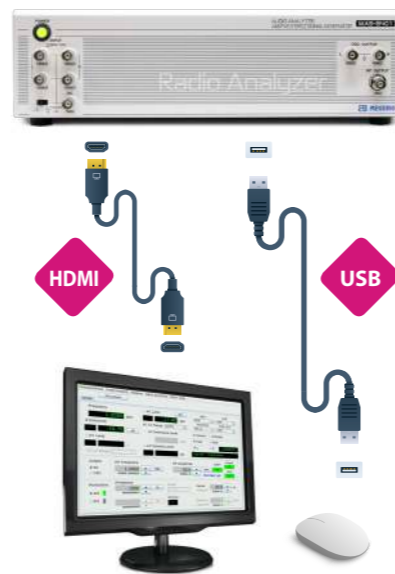
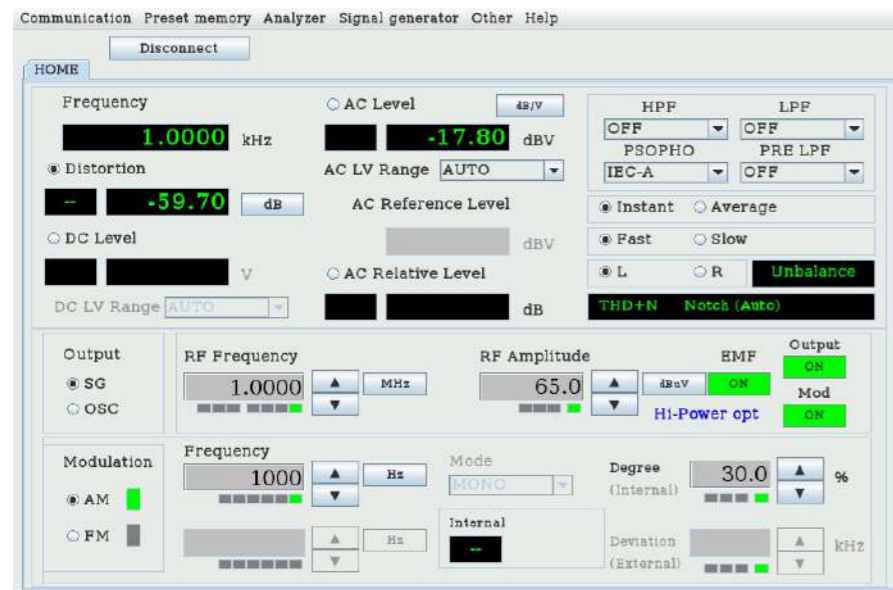
Controlled by PC application

Connect to your PC via LAN port or USB on the rear panel. Use the included application to control it.



The external display is connected to the device and controlled by the built-in application

Connect the display using the HDMI port on the rear panel.



API

Frequently used settings and automatic measurement can be created as an application.

The product comes with an API that runs in a .Net Framework environment.

At the same time, it includes examples created using Microsoft Visual Studio and sample code for API calls.

```

using System;
namespace ConsoleApp1
{
    class Program
    {
        public static void Main()
        {
            // Create an instance of MAS8400 Control class
            MAS8400Control mas8400 = new MAS8400Control();

            // Connect with MAS-8400 via LAN (when connecting with IP address: 172.20.134.5)
            // Set the IP address according to your environment
            mas8400.Connect_LAN("172.20.134.5");

            // Error processing (when the return value is not 0)
            if (mas8400.AC_Range(0) != 0)
            {
                // Acquire error contents from Err_Message property and display
                Console.WriteLine("LAN connection" + mas8400.Err_Message);
                return;
            }

            // Set AC range (0: When setting to auto range)
            mas8400.AC_Range(0);

            // Error processing (when the return value is not 0)
            if (mas8400.AC_Range(0) != 0)
            {
                // Acquire error contents from Err_Message property and display
                Console.WriteLine("AC range setting" + mas8400.Err_Message);
                return;
            }

            // Successful completion
            Console.WriteLine("Setting was successful.");
            Console.ReadKey();
        }
    }
}
    
```

4.2 Method	
(1)USB communication connection (common)	
Method name	Connect_USB
Format	int Connect_USB (String COM_Name);
Argument	COM_Name: Virtual COM port name (eg "COM3")
Return value	0: Success -1: Connection Failed
Description	Establish a USB connection.
(2)LAN communication connection (common)	
Method name	Connect_LAN
Format	int Connect_LAN (String IP_Address);
Argument	IP_Address: IP address of MAS-8421 (eg "192.168.10.20")
Return value	0: Success -1: Connection Failed
Description	Establish a LAN connection.

CASE

Corresponding model for each inspection

- Automotive navigation
- Car audio

- Electronic musical instrument
- Audio equipment
- Broadcast equipment

- Communication equipment
- Radio



MAS-84010SC

- Tuner reception
- Signal source for measurement
- Audio signal measurement



MAS-8400SC

- Signal source for measurement
- Audio signal measurement



MAS-8421

- Tuner reception

SPECIFICATIONS

Model number	MAS-8401OSC	MAS-8401	MAS-8410OSC	MAS-8410	
Measurement section					
DC Voltage measurement	Measuring channel	1CH			
	Input impedance	$\geq 1M\Omega$			
	Input range	316mVFS to 100VFS 4 range (AUTO/MANU)			
	Measurement accuracy	Full scale value $\pm 0.5\%$ for each range			
	Measurement resolution	0.1% of the full scale value for each range			
AC Voltage measurement	Measuring channel	Switching 2CH			
	Input method	Balanced, unbalanced switching			
	Input impedance	$\geq 100k\Omega$			
	Input range	316mV(-10dBV) ~ 100.0V(40dBV) 6 range(AUTO/MANU)			
Level measurement	Response characteristics	True mean value			
	Effective measurement range	0.0316mVrms to 100.0Vrms			
	Measurement accuracy	$\leq \pm 0.4dBV$ (40dBV to -70dBV at 1 kHz)			
	Measurement resolution	0.1% of each full scale value			
	Frequency response	$\leq \pm 0.8dBV$ (10Hz ~ 110kHz) 1kHz standard (*excluding 20Hz to 80kHz) $\leq \pm 0.4dBV$ (20Hz to 80kHz) 1kHz standard			
Distortion measurement	Measurement frequency	10Hz to 110kHz			
	Measurement accuracy	$\leq \pm 1dB$ (20Hz ~ 20kHz) $\leq \pm 3dB$ (10Hz to 110kHz)			
	Measurement resolution	0.1% of each full scale value			
	Measurement mode	THD and THD+N Notch filter. Frequency setting possible			
	Residual distortion factor	Typical value at 10dBV input level to 10 dBV $\leq -100dB$: 10Hz to 15kHz(80kHzBW) $\leq -90dB$: 15.1kHz to 20kHz(80kHzBW) $\leq -80dB$: 20.1kHz to 110kHz(500kHzBW)			
Filter	Type	HPF(100Hz/200Hz/400Hz),LPF(20kHz/80kHz),PRE LPF(15kHz/20kHz)			
	Aural compensation (PSOPHO)	IEC-A,CCIR/ARM,DIN-A			
Frequency measurement	Frequency measurement range	10Hz to 110kHz			
	Resolution display	Frequency $\geq 100Hz$:5 digits display Frequency < 100Hz : 0.01Hz			
	Accuracy	$\pm 5 \times 10^{-5} \pm 1$ digit			
	Input range	25mVrms to 100.0Vrms			
Oscillator section					
OSC	Number of outputs	Distribution type 2 output		Distribution type 2 output	
	Output method	Unbalanced		Unbalanced	
	Output impedance	600 Ω		600 Ω	
	Oscillation frequency	10Hz ~ 1kHz,0.1Hz step		10Hz ~ 1kHz,0.1Hz step	
	Frequency setting accuracy	1.001kHz~110kHz,1Hz step		1.001kHz~110kHz,1Hz step	
	Level setting resolution	$\leq \pm 2\%$		$\leq \pm 2\%$	
	Output level range	+20dBV to -79.9dBV(OPEN)		+20dBV to -79.9dBV(OPEN)	
	Frequency response	+20dBV to -70dBV(OPEN)		+20dBV to -70dBV(OPEN)	
		$\leq \pm 0.4dBV$: 20Hz to 20kHz (1kHz ref.)		$\leq \pm 0.4dBV$: 20Hz to 20kHz (1kHz ref.)	
		$\leq \pm 0.8dBV$: 10Hz to 110kHz (1kHz ref.)		$\leq \pm 0.8dBV$: 10Hz to 110kHz (1kHz ref.)	
	Distortion factor	+10dBV typical value		+10dBV typical value	
		$\leq -100dB$: 100.1Hz to 15kHz(80kHzBW)		$\leq -100dB$: 100.1Hz to 15kHz(80kHzBW)	
		$\leq -90dB$: 10Hz to 100Hz(80kHzBW)		$\leq -90dB$: 10Hz to 100Hz(80kHzBW)	
		15.001kHz to 20kHz(80kHzBW)		15.001kHz to 20kHz(80kHzBW)	
	$\leq -80dB$: 10Hz to 110kHz(500kHzBW)		$\leq -80dB$: 10Hz to 110kHz(500kHzBW)		

General Specifications

Model number	MAS-8401OSC	MAS-8401	MAS-8410OSC	MAS-8410	MAS-8421
Interface	HDMI x 1 / LAN(TCP/IP, 10/100 Base-T) x 1 / USB-A x 3 / USB-B x 1				
Rated supply voltage	AC100V to 240V 50/60Hz				
Power consumption	Approx. 45VA	Approx. 40VA	Approx. 35VA	Approx. 30VA	Approx. 20VA
External dimensions (W x H x D mm)	360x100x430		300x100x385		240x100x385
Weight	Approx. 6kg		Approx. 4.5kg		Approx. 4kg
Accuracy guaranteed temperature and humidity range	10°C to 35°C, 5% to 85% RH(no condensation)				
Storage temperature and humidity range	-10°C to 50°C, 5% to 95% RH(no condensation)				

Model number	MAS-8401OSC, MAS-8401, MAS-8421				
SG section					
RF signal output	Output method	DDS method			
	Frequency range	100kHz to 170MHz			
	Set resolution	100 Hz			
	Frequency accuracy	$\pm 5 \times 10^{-6}$			
	Output level range	Standard	-20dB μ V to 126dB μ V(EMF)		
		Options	-20dB μ V to 132dB μ V(EMF)		
	Set resolution	0.1 dB			
	Output level accuracy	Standard	± 1.5 dB : 0 to 126 dB μ V (EMF)		
		Options	± 2.0 dB :-20 to 0 dB μ V (EMF) ± 1.5 dB : 0 to 132 dB μ V (EMF) ± 2.0 dB :-20 to 0 dB μ V (EMF)		
	Output impedance	50 Ω			
	VSWR	≤ 1.3			
	Spurious	Harmonics : $\leq -30dBc$ / Non-harmonic : $\leq -40dBc$			
	Residual FM	$\leq -80dB$ (AF 1kHz, FM 75kHz)			
	Residual AM	$\leq -55dB$ (AF 1kHz, AM 30%)			
	Leakage disturbance	Does not affect performance during 0dB μ V output			
Attenuator	Semiconductor				
RANGE OUT	Signal output for external relay drive				
FM modulation	Frequency deviation	0kHz to 135kHz			
	Set resolution	0.1kHz			
	Modulation accuracy	10.7 MHz ± 1 MHz, 76 MHz to 108 MHz : \pm (set value $\times 0.1+0.5$) kHz			
		0.3 MHz to 170 MHz : \pm (set value $\times 0.1+1$) kHz			
	Distortion factor	$\leq 0.05\%$ (10.7MHz ± 1 MHz, 76 to 108MHz)			
		$\leq 0.1\%$ (0.3MHz to 170MHz)			
	Parasitic AM	(AF 1kHz, FM 75kHz, BW50~20kHz, DE-EMPHASIS 50 μ s)			
		$\leq 0.5\%$ (10.7MHz ± 1 MHz, 76 to 108MHz)			
	External modulation	Frequency range	50Hz to 100kHz		
			$\pm 1dB$ (1kHz ref.)		
		Impedance	10k Ω (unbalanced)		
			1Vp-p $\pm 2\%$		
	FM stereo modulation	Internal modulation frequency	LEFT 10Hz to 100kHz, 1Hz step		
			RIGHT 10Hz to 100kHz, 1Hz step		
		Except mono mode, the setting of $\geq 15kHz$ is not guaranteed.			
Modulation mode		MONO/L=R/L/R/L=-R/L&R/OFF			
L,R separation		$\geq 55dB$			
Modulation range		0 to 135%(75kHz/100%) (MONO only to 150%)			
Set resolution		1%			
AM modulation	Pilot setting range	0 to 15%			
	Pilot setting resolution	0.1%			
	Preemphasis	25 μ s / 50 μ s / 75 μ s / OFF			
	Modulation range	0 to 100%			
		$> 126dB\mu$ V(EMF) 30% Max			
	Set resolution	0.1%			
	Modulation accuracy	0.4 MHz to 1.7 MHz : \pm (set value $\times 0.1+1$)%			
		0.15 MHz to 170 MHz : \pm (set value $\times 0.1+2$)%			
	Distortion factor	RF frequency (MHz)	Modulation		
			0 to 30% : 30.1 to 60% : 60.1 to 80%		
		0.4 ~ 1.7		$\leq 0.5\%$	
		0.15 ~ 170		$\leq 1.5\%$	
	However, RF output level 120dB μ V (EMF)				
	Internal modulation frequency	10Hz to 20kHz,1Hz step			
		External modulation	Frequency range		
50Hz to 20kHz					
$\pm 1dB$ (1kHz ref.)					
Impedance					
10k Ω (unbalanced)					
Input voltage					
1Vp-p $\pm 2\%$					

Application's operating environment

OS	Microsoft Windows 7 SP1 / 10
CPU	Intel, AMD 3 GHz or higher
Memory	4 GB or more
Hard drive free space	10 GB or more
CD-ROM drive	Required during installation
Screen resolution	1024 x 768 or higher
Others	USB driver (provided by us) must be installed .NET Framework Ver.4.7.2 or higher installation required

ORDERING INFORMATIONS

	Model number	Description
Main unit	MAS-8401OSC	Audio analyzer(with/OSC)+AM/FM signal generator
	MAS-8401	Audio analyzer +AM/FM signal generator
	MAS-8410OSC	Audio analyzer(with OSC)
	MAS-8410	Audio analyzer
	MAS-8421	AM/FM signal generator
Option*	High output level option for model MAS-8401 and MAS-8421	

* It is possible to correspond according to the customer's use. Please feel free to contact us.

Products that can be used together

For BTL (Balanced Transformer Less) amplifier, balance to unbalance adapter.

MBA-9407



Informations

In order to use this product safely for a long time, please use our calibration and repair service.

E-mail : PWsales@hq.keisoku.co.jp

TEL : +81-44-223-7950

*The contents of this catalog are as of August 2020. For purchase, please check the latest specifications, price, availability. *The names of companies and products mentioned herein are trademarks or registered trademarks of their respective companies. *Specifications, shapes, etc. described are subject to change without prior notice due to improvements, etc.

*The contents described are accurate information, but if there is a point that you notice such as an error by any chance, we would appreciate it if you could inform us.



KG KEISOKU GIKEN Co., Ltd.
PowerElectronics Sales Dept.

Hiyoshi Operation 4-11-1 Minamikase, Saiwai-ku, Kawasaki-shi,
Kanagawa, Japan

TEL +81-44-223-7950 FAX +81-44-223-7960

E-mail : PWsales@hq.keisoku.co.jp / <https://www.keisoku.co.jp>