

# MDSG-031

## Signal Generator for Digital Terrestrial TV Broadcasting



**MDSG-031**  
Multi-frequency Digital Signal Generator  
for terrestrial TV broadcasting

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DSG-031 is a signal generator conformed to Japanese Digital Terrestrial TV Broadcasting standard (ISDB-T). The device consists of TS data generator, OFDM modulator, Upconverter, Noise generator, PRBS signal generator and BER measurement unit.

### Features

#### ◆ Three waves output

The MDSG-031 integrates three upconverters. Each converter can individually program frequencies, output levels and C/N.

Each wave can output from three terminals or three combined waves can output from one terminal.

As for combined waves, one wave can be used as a main signal, the two other waves as interference signals (interference of adjacent channels).

Wideband measurement will be easily realized by assigning three waves to high, middle and low frequency ranges.

#### ◆ Wide dynamic range

The output level can be programmed in the range from -100dBm to +10dBm.

#### ◆ BER measurement (Option)

The MDSG-031 uses PRBS (PN23 or PN15) as transmission data.

The injection point of PRBS can be programmed before Reed-Solomon or before/after convolution codes.

The device also has a function of BER measurement. (MPEG-TS input)

In addition, BER measurement at multiple locations will be enabled with a use of the BCS-010, a BER measurement unit.

#### ◆ Noise Generator

The MDSG-031 can program the noise level (C/N from 0dB to 40dB) to be added to the three waves individually.

Inspections to use different C/N for different channels can be made without changing settings.

#### ◆ Fading (Option)

The MDSG-031 can generate fading signals in the three waves individually, which will be used for tests for diversity of mobile receiver.

#### ◆ Output of moving pictures (Option)

By the use of data of moving pictures (MPEG2 TS) stored in the internal memory moving pictures can output.

It can be used for aging test process for television sets.

## General Specifications

<u>General</u>		
Ambience	Temperature	10 degree C to 40 degree C
	Humidity	30% to 80% (without dews)
Power supply voltage range		90V to 250VAC
Power consumption		200W or less
Dimensions		430mm (W) x 200mm (H) x 480mm (D)
Weight (main body)		20kg or less
<u>TS signal input</u>		
DVB-ASI	0.8Vp-p, 75ohm (officially announced) BNC-R	
DVB-SPI	LVDS, differential 100ohm (D-sub 25-pin)	
Input packet format	188/204byte	
Input signal format	MPEG-2 TS (ISO/IEC13818-1)	
<u>TS signal output</u>		
DVB-ASI	0.8Vp-p, 75ohm (officially announced) BNC-R	
DVB-SPI	LVDS, differential 100ohm (D-sub 25-pin)	
Output packet format	188/204byte	
Output signal format	MPEG-2 TS (ISO/IEC13818-1)	
<u>MPEG2 TS signal generator</u>		
Packet format	188byte	
Signal format	MPEG-2 TS (ISO/IEC13818-1)	
Replay	To be repeated	
<u>Modulation</u>		
Signal format	Digital Terrestrial TV Broadcasting : ISDB-T (compliant with ARIB STD-B31)	
Modulation	OFDM	
Bandwidth	5.6MHz	
Guard interval	1/4, 1/8, 1/16, 1/32	
Number of layers	3 layers at the maximum	
Mode	MODE1, MODE2, MODE3	
Sub-carrier modulation	DQPSK, QPSK, 16QAM, 64QAM	
Inner code	Convolution code; coding rate: 1/2, 2/3, 3/4, 5/6, 7/8 with on and off	
Outer code	Reed-Solomon code (204/108) with on and off	
<u>Noise generator</u>		
Variable range	C/N from -5dB to 40dB with on and off	
Programming resolution	0.1dB	

<b>RF signal output</b>		
Frequency	Center frequency	50MHz to 870MHz
	Resolution	1kHz
	Stability	+/- 5ppm or less
Upconverter	Channel	3 (On and off can be made individually.)
Output power level	Range	-100dBm to +10dBm (+5dBm at the maximum when three waves are combined.)
	Connector	N-J, 50ohm (officially announced)
Spurious	Harmonic	-40dBc or less
	Non-harmonic	-50dBc or less
<b>Reference signal</b>		
Internal oscillator	Oscillating frequency	10MHz
	Stability	1ppm or less (10 to 50 degree C)
Reference output	Connector	BNC-R
	Level	LVC MOS
Reference input	Connector	BNC-R
	Level	LVC MOS
	Frequency	10MHz +/- 1ppm or less
<b>PRBS Signal generator</b>		
Length of PRBS pattern	2 <sup>23</sup> -1, 2 <sup>15</sup> -1 (compliant with ITU-T 0.151)	
<b>Error detection</b>		
Data	PRBS	
Length of PRBS pattern	2 <sup>23</sup> -1, 2 <sup>15</sup> -1	
Measurement time	Measurement can be made in the range from 1 to 3600 seconds	
<b>External interface</b>		
RS-232C	D-sub 9-pin	
Ethernet	10BASE-T, 100BASE-T	
USB	USB1.1, USB2.0	
GP-IB	IEEE Std 488.1-1987 (Option)	
Optical drive	DVD-ROM (Option)	

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