

# ISDB-T All-in-One RF Signal Generator



ISG500 >



## Overview

**ISG500** is the **all-in-one ISDB-T signal generator** with ISDB-T standards for digital terrestrial TV system used in Japan. It is the most flexible solution for design evaluation and conformance test of ISDB-T receiver such as set-top box, TV, Car navigation and mobile phone which require a live modulated RF signal.

ISG500 is a complete solution for ISDB-T Signal generation with built-in ISDB-T modulators, upconverters and MPEG2 TS Generator in a portable unit. It can also support all DTV standard in one unit including DVB-T, DVB-C, ATSC, OpenCable, DVB-S/S2 and DMB-TH. Most importantly, ISG500 supports multi signal output (Max. 2 RF) in one unit that allows simultaneous signal use. It will save your cost and time for buying several other DTV signal generators.

## Features

### General Characteristics

- Modulator : ISDB-T Layered-OFDM  
(Options : DVB-T, ATSC, DVB-C, OpenCable , DVB-S/S2, ISDB-T, DVB-T/H, DMB-TH, ADTB-T)
- RF Upconverter : Multi RF System (50 ~870MHz, 1KHz steps), Max.2
- RF Level : -110 ~ 0dBm (0.1dB steps, -110~ +20dBm : Optional)
- Easy Channel Selection by World-wide Channel Table DB
- MPEG2 TS Generator : Internal Generation
- MPEG2 TS Generator : External DVB-ASI/SPI Output (Optional)
- TMCC Generation
- 1 Seg. & 12 Seg.(HD) Full Support
- Real-time A/V Decoding (MPEG2 SD/HD & H.264 QVGA/SD/HD)
- Automatic Modulator setting (TMCC Base) \* ISDB-T System Only
- Automatic Modulator setting (NIT Base) \* DVB/ISDB-T System Only
- Automatic Modulator setting (PCR bitrate Base/Dynamic Mode)
- Manual Modulator Setting (Parameter Setting)
- Manual Bitrate Setting
- TS Analysis Information
- Jitter Injection (TR 101 290 Level Error)
- C/N Noise Generation (AWGN)
  - C/N Range : 0~+45dB (Resolution : 0.1dB)
  - Noise BW : 0~10MHz according from Signal CH BW (Spec.)
- TS Packet Size : RAW/188/204/188+16(LVDS) (ASI Option)
- Inserting Null Packets (Static Mode)
- Stream & System Monitoring
- Play List (Sequential Play)
- Memory Play on RAM Cache memory
- Touch Screen & Easy Operation GUI (Patent Registered)

### PRBS Pattern Test

- Pseudo random signal (PRBS-9)
- Pseudo random signal (PRBS-15)
- Pseudo random signal (PRBS-23)

### Intended Applications

- ISDB-T Test & Measurement
- ISDB-T 1SEG. Receiver Development
- ISDB-T 1SEG. Receiver QC
- ISDB-T Chip Development
- ISDB-T Station Design & Verification
- ISDB-T Field Test
- 1SEG. Receiver Manufacturing



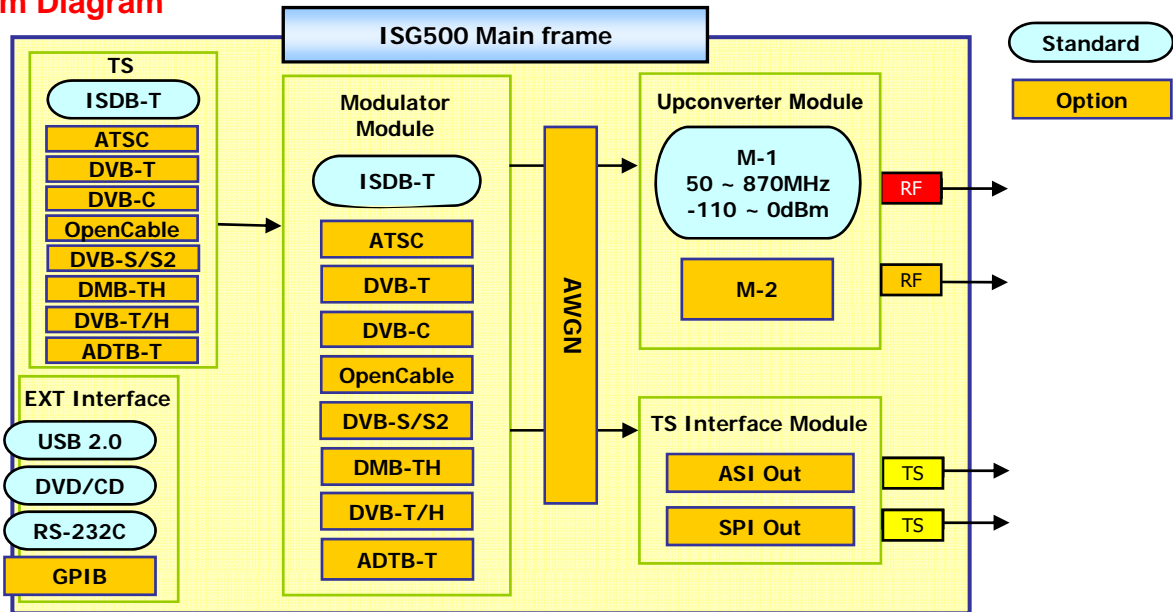
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## System Diagram



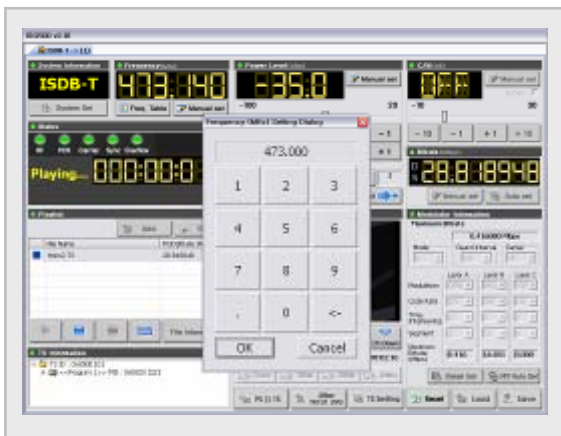
## User Interface



System Information Setting



Modulator Setting



Power Level Setting



TMCC Information & Generation



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## Specifications

### Modulation Specifications

- \* Channel coding system  
Broadcasting system
  - Digital Terrestrial TV : ARIB STD-B31
- \* Transmission Parameter
  - Hierarchical Layer : TV (3 layer max. )
  - MODE : MODE 1, MODE 2, MODE 3
  - Guard Interval : 1/4, 1/8, 1/16, 1/32
  - Modulation Mode : DQPSK, QPSK, 16QAM, 64QAM
  - Coding Rate : 1/2, 2/3, 3/4, 5/6, 7/8
  - Time Interleave length : 0 to 32 (depend on broadcasting)
  - Partial Reception : Settable
- \* Number of Segments
  - Mobile TV : 1 Seg. Mobile TV broadcasting
  - Digital TV : 13 Seg. Digital TV broadcasting

### RF Specifications

- Output Connector : N type
- RF Output Frequency : 50~870 MHz (VHF/UHF)
  - \* DVB-S/S2 RF Output Frequency: 950 ~ 2150MHz
- Frequency Resolution : 1Hz
- Bandwidth : 6/7/8 MHz (7/8 MHz – Future Support)
- Frequency Accuracy :  $3 \times 10^{-6} / 25 \text{ }^{\circ}\text{C}$
- RF Output Level : -110 ~ 0dBm
- RF Level Resolution : 0.1dB steps
- RF Level Accuracy :  $\pm 0.5\text{dB}$  relative to the level at 18-33  $^{\circ}\text{C}$
- RF Impedance : 50  $\Omega$

### Operating Specifications

- Power supply : AC 100 ~ 240V, 50/60Hz
- Power consumption : Less than 400W
- Operating temperature : 10 to 40  $^{\circ}\text{C}$
- Operating humidity : 20 ~ 85% RH (No Condensation)
- Guaranteed temperature : 15 to 35  $^{\circ}\text{C}$
- Guaranteed humidity : 20 ~ 85% RH (No Condensation)
- Storage temperature : -40 to +70  $^{\circ}\text{C}$  / 20 ~ 85% RH
- Operating environment : Indoor
- Operating attitude : Around 2000m
- Over-voltage category : II
- Pollution degree : 2
- Dimensions : 435(W) x 231.8(H) x 519.7(D) mm
- Weight : Approx. 17kg (without options)

### OS system

- Embedded OS

### User interface system

- 10.4 inch TFT color LCD (1024 x 768)
- Touch Screen

### External Interface system

- USB Interface : USB HDD, USB Stick
- Remote Control : RS-232C, GPIB (Optional)

### Modulator Options

- DVB-T Module (MM-501)  
Broadcasting system
  - Digital Terrestrial TV : DVB-TTransmission Parameter
  - Hierarchical mode : Fully supported
  - Modulation : COFDM
  - IFFT : 2K, 8K
  - Guard Interval : 1/4, 1/8, 1/16, 1/32
  - Modulation Modes : QPSK, 16, 64QAM
  - Coding Rate : 1/2, 2/3, 3/4, 5/6, 7/8
- ATSC Module (MM-502)  
Broadcasting system
  - Digital Terrestrial TV : ATSCTransmission Parameter
  - Modulation : 8VSB
- DVB-C Module (MM-503)  
Broadcasting system
  - Digital Cable TV : DVB-CTransmission Parameter
  - Modulation : QAM (Annex - A/C)
  - Modulation Modes : 32, 64, 128, 256QAM
- OpenCable Module (MM-504)  
Broadcasting system
  - Digital Cable TV : OpenCableTransmission Parameter
  - Modulation : QAM (Annex - B)
  - Modulation Modes : 64, 256QAM
- DVB-S/S2 Module (MM-505)  
Broadcasting system
  - Digital Satellite TV : DVB-S/S2Transmission Parameter
  - Modulation : DVB-S (BPSK, QPSK)  
DVB-S2 (QPSK, 8PSK)
  - Modulation Modes : 32, 64, 128, 256QAM
  - Integrated L-Band Upconverter with on-board
- DMB-TH Module (MM-506)  
Broadcasting system
  - Digital Terrestrial TV : DMB-THTransmission Parameter
  - Modulation : TDS-OFDM
  - Modulation Modes : 4QAM(QPSK), 16, 64QAM
  - IFFT : 4K
  - Guard Interval : 1/4, 1/9
  - Coding Rate : 0.4, 0.6, 0.8

### Function Options

- GPIB Module (FM-202)
  - IEEE 488.2
- AWGN Module (FM-203)
  - C/N range : 0 ~ +45dB
  - C/N resolution : 0.1 dB Steps
  - Noise Band Width : 0 ~ 10MHz



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## Ordering Information

Base Model	Description	Notes
ISG500	<b>ISDB-T Signal Generator</b> - 1 Built in ISDB-T Modulator & 1 Built in RF Upconverter	* Single RF (Base) : Max. 2 Modulators
	* RF Output Frequency : 50 ~ 870 MHz (VHF/UHF) * RF Frequency Resolution : 1Hz * RF Level Resolution : 0.1dB steps	
ISG500L	<b>ISDB-T Signal Generator</b> - 1 Built in ISDB-T Modulator & 1 Built in RF Upconverter	* Multi RF (Dual RF)
	* RF Output Frequency : 50 ~ 870 MHz (VHF/UHF) * RF Frequency Resolution : 1KHz * RF Level Resolution : 1dB steps	
ISG500S	<b>DTV Signal Generator – DVB-S/S2 built-in RF Upconverter</b>	* ISG500S needs modulator option MM-505
	* RF Output Frequency : 950 ~ 2150 MHz * RF Frequency Resolution : 200KHz * RF Level Resolution : 1dB steps	

Options	Description	Notes	
Modulator Option	MM-501	DVB-T Module	
	MM-502	ATSC Module	
	MM-503	DVB-C (Annex-A/C) Module	
	MM-504	OpenCable Module	
	MM-505	DVB-S/S2 Module * Frequency: 950 ~ 2150MHz	
	MM-506	DMB-TH(DTMB) Module	
	MM-508	DVB-T/H Module * DSG500(DVB-T/H) Application	
	MM-509	ADTB-T Module	
RF Option	RM-600	Second Upconverter Module *Note1 - Frequency Resolution : 1Hz - RF Level Resolution : 0.1dB steps	*Note1 : Requires one or two ISG500 MM-50X Modulator options
	RM-600L	Second Upconverter Module – Lite Model *Note1 - Frequency Resolution : 1KHz - RF Level Resolution : 1dB steps	
	RM-600S	Second Upconverter Module – DVB-S/S2 Model *Note1 - RF Output Frequency : 950 ~ 2150MHz - Frequency Resolution : 200KHz - RF Level Resolution : 1dB steps	
Level Option	LE-603	Level Extension Module * -110 ~ +20dBm	* Except DVB-S/S2
Function Option	FM-200	ASI Out Module	* Max. 2 functions can be added.
	FM-201	SPI Out Module	
	FM-202	GPIO Module	
	FM-203	AWGN Module * 0 ~ +45dBm ** DVB-S/S2 is not available	
ETC Option	EF-301-300	HDD – 300G	* When a client selects additional option after purchasing product, all units should be returned to the factory.
	EF-301-600	HDD – 600G	
	EF-303	Option Upgrade	

\* All Specifications and Features are subject to be changed without notice



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