TMG2000 is the Signal Generator RF integrated. It is the only one which can completely support Korean T-DMB broadcasting, and Chinese TMMB. TMG2000 includes T-DMB Video/Audio Service (H.264 + BSAC), DAB Service (Audio + DATA), Ensemble Multiplexer, OFDM Modulator and RF Up-converter. A user can use it to develop a DAB/DMB receiver and use for QC and Mass Production in easy and convenient.

Especially, TMG2000 has big difference from other simple DAB simulator because it generates same T-DMB broadcasting signal and information as present 6 DMB broadcasting stations in Korea. It means TMG2000 can make almost same broadcasting environment as real broadcasting station (Available to generate service type, number and information of each broadcasting station). As the result, a manufacture of a DAB/DMB receiver can reduce diverse risk happened during the development.

### Overview

**Features**

**System**
- All-in-One system
  (DMB Service + DAB Service + Ensemble MUX + OFDM Modulator + RF Upconverter)
- Extend a channel up to 5 per an unit
- Support Remote Control RS232C, GPIB (Optional)
- Support user friendly UI based on Windows
- Size of storage of video, audio and data (Basic 160GB~1TB)
- Support Reconfiguration
- Real-time Live Mux. (Ethernet, ASI)

**Ensemble Multiplexing**
- Support Enhanced Packet Mode (EN 300 401 v.1.4.1)
- No limit of No. of Service and Service Component
- RS/CI Encoder integrated
  (Support RS/CI 204byte Video, 188byte Video)
- Support big size of Ensemble on real-time
  (Default : 1.152Mbps ,FEC=1/2, Changeable by Protection Level)
- Available to extend specification such as BiFS
- Support National FIG Information
  (Korea, China, Germany, France, Italy, Netherlands, United Kingdom, Russian Federation)
- Support Programme Schedule Simulation
- Support Primary/Secondary Service, Primary/Secondary Label
- ETI recording for saving ETI signal as file type
- ETI File Generation
- ETI Signal Input (Optional)
- ETI Signal RF Output (Optional)
- Make ETI File (Optional)

**Service**
- Support Data Broadcasting (MOT, BWS, SLS, PAD)
- Support Audio
- Support Audio Protection Level
- Support Video 8~1824(kbps)
  (Available to change it per 8kbps)
- Support Video Protection Level
  (1-A, 2-A, 3-A, 4-A, 1-B, 2-B, 3-B, 4-B)
- FIG View

**ETC**
- Support BER pattern for Actual Measurement BER
  (All 0, All 1, All 01, All 10)
- Support CAS (Optional)
- Support Auto Test (Optional)
- Support C/N Generation (Optional)
  - C/N Range : 0 ~ +45dB (Resolution : 0.1dB)
  - Noise BW : ① 0 ~ 10MHz according from Signal CH BW (Spec.)
  ② User Select : ~ Max. 45MHz
- P/S Service Component
T-DMB/DAB/DAB+(TMMB) Multi Signal Generator

**System Diagram**

- **Service File**
  - Video
  - Audio
  - Data

- **TS Interface Module**
  - Ethernet In
  - ASI In

- **ETI Interface Module**
  - ETI In

- **EXT Interface**
  - USB 2.0
  - RS-232C
  - DVD/CD
  - GPIB

- **TMDG2000 Main frame**

- **Upconverter Module**
  - M-1
  - Band3 & L-Band
  - -110 ~ 0dBm
  - M-2
  - M-3
  - M-4
  - M-5

- **TS Interface Module**
  - ETI Out

**User Interface**

- **Main UI**
- **Ensemble Monitoring**
- **Ensemble Multiplexing**
- **Transmission Mode Change**
T-DMB/DAB/DAB+(TMMB) Multi Signal Generator

Specifications

RF Specifications
- RF Frequency Range: Band II, III, L
  - Band III: 174Mhz~250Mhz
  - L-band: 1452Mhz ~ 1492Mhz
- RF Power Level: -110 ~ 0dBm
- RF Level Resolution: 0.5dB steps
- RF Level Accuracy: ±0.5dB
- Frequency Accuracy: 3 x 10^{-6} / 25 °C ±1 °C
- RF Impedance: 50 Ω

Modulation Specifications
- VSWR (Voltage Standing Wave Ratio): Better than 1:1.5
- Modulation
  - High performance OFDM modulation (Good SNR, Low Phase Noise architecture)
  - D-QPSK (Different Quadrature Phase Shift Keying)
- Transmission Mode: Mode 1,2,3,4
- IF Output: 36MHz

Operating Specifications
- Power supply: AC 100 to 240V, 50/60Hz
- Power consumption: Less than 400W
- Operating temperature: 10 to 40 °C
- Operating humidity: 20 to 85% RH (No Condensation)
- Guaranteed temperature: 15 to 35 °C
- Guaranteed humidity: 20 to 85% RH (No Condensation)
- Storage temperature: -40 to +70 °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 (Not including options)

OS system
- Windows XP

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)

Function Options
- GPIB Module (FM-202): IEEE 488.2
- AWGN Module (FM-203)
  - Input/Output: SMA (Female) 50/75Ω Select
  - C/N range: 0 ~ +45dB
  - C/N resolution: 0.1 dB Steps
  - Noise Band Width: 0 ~ 10MHz
# Ordering Information

<table>
<thead>
<tr>
<th>Base Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMG2000</td>
<td>T-DMB/ DAB/ DAB+(TMMB) Signal Generator</td>
</tr>
<tr>
<td></td>
<td>* RF Power Level : -110 ~ 0dBm</td>
</tr>
<tr>
<td></td>
<td>* RF Output Level Resolution : 0.5dB steps</td>
</tr>
<tr>
<td></td>
<td>* Frequency Range: Band II, III, L Band</td>
</tr>
<tr>
<td></td>
<td>* Frequency Resolution: 1KHz</td>
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<tr>
<td></td>
<td>* I/Q Output supported</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Modulator Option (Option T)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-201</td>
<td>T-DMB/DAB Modulator &amp; Upconverter Module</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Selectivity Test &amp; Multi Modulator &amp; Multi RF</td>
<td></td>
</tr>
<tr>
<td>T-202</td>
<td>T-DMB/DAB Auto test Module</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Sensitivity, Max Power, Selectivity, Black Out, BER Test</td>
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</tr>
<tr>
<td>T-203</td>
<td>ETI Interface Module</td>
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</tr>
<tr>
<td></td>
<td>* Live ETI Recording &amp; Player</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* Two additional T-201 option can be selected. (3 modulators &amp; 3 RF in total)</td>
<td></td>
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</tbody>
</table>

| **Modulator Option (Option ST)** | | |
| ST-201 | DVB-T/H Module * DSG500 (DVB-T/H) Application  |
| | * If T-201 & T-202 options are selected, additional ST option cannot be added.  |
| ST-202 | DVB-H MUX/ESG Generator Module * DHG2000 Application  |
| | * If ST-203 option is selected, simultaneous RF generation is not supported.  |
| ST-203 | ISDB-T Module * ISG500 Application  |
| | * Delivery for upgrade after purchasing takes 4 weeks with additional charge.  |

| **Modulator Option** | | |
| MM-511 | IQ Interface Module * DVB-T/H Application only  |
| | * Can be selected only after selecting ST- 201 or ST-202 option  |

| **Function Option** | | |
| FM-202 | GPIB Module  |
| FM-203 | AWGN Module (0 ~ +45dB)  |
| FM-204 | Fading Module *  |
| | * Not supported yet (2007’ 4Q)  |

| **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