

DVB-H Test & Measurement

DVB-H Signal Generator – DHG300

DVB-H Real-Time MUX/ESG Generator – DHG2000

DVB-H Signal Analyzer – DHA1000/DHA100

DVB-H Field Capture system – DHC100

DVB-H H.264 Analyzer – ESA100

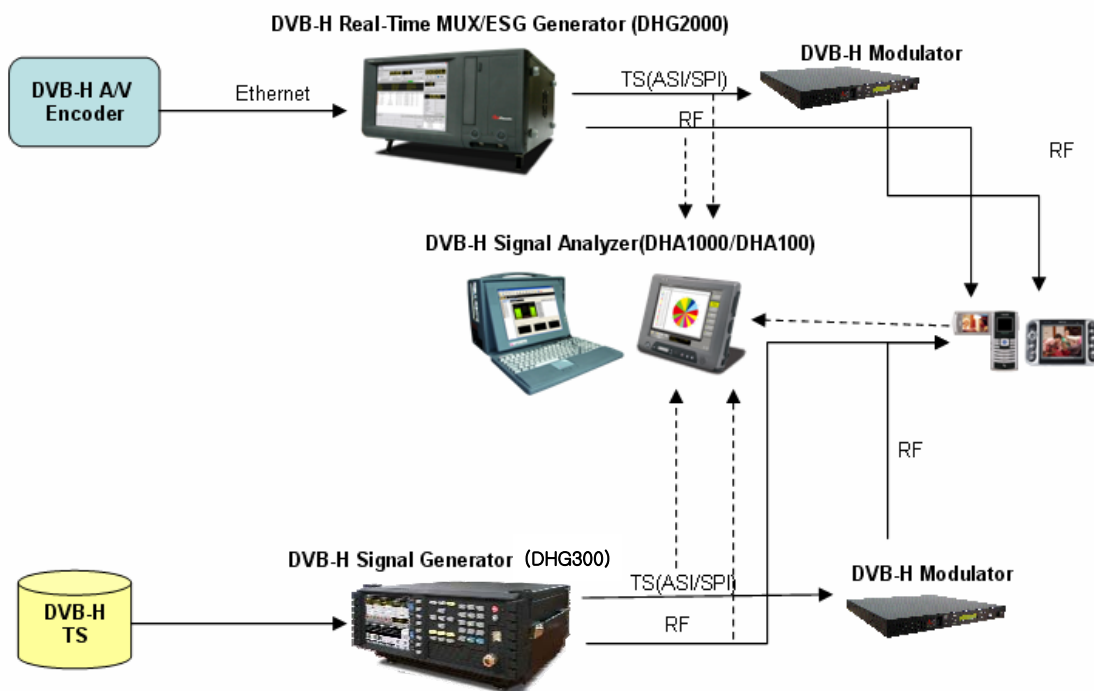




DTVinteractive
DVB-H Development & Test Solutions

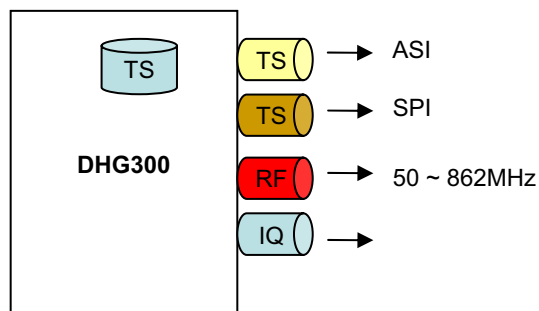
DTVinteractive's DVB-H Test & Measurement solutions are the most advanced equipments for the development & mass-production of DVB-H receiver and quality control of DVB-H service. With its integrated DVB-H modulator, DVB-H receiver manufacturers can set up cost-effective and flexible R&D environment. DTVinteractive's DVB-H solutions fully support MPE-FEC, Time-Slicing and Analysis of DVB-H service and it makes you preoccupy new DVB-H receiver and contents market in advance of your competitor.

Test-Bed system Configuration for DVB-H Receiver Development



DVB-H Generator Solutions

DVB-H Signal Generator – DHG300



● Features

DHG300 system

- Integrated All-In-One DVB-H Signal Generator (RF)
- Support DVB-H or T-DMB/DAB Signal Generation (Multi Modulator & Single RF output)
- Support C/N Generation
 - C/N Range : -10~+30dB (Resolution : 0.5dB)
 - Noise BW : ① 0~10MHz according from Signal CH BW (Spec.)
 - ② User Select : ~ Max. 45MHz
- Support Fading Simulation (Future Support)
 - 6 CHs (Optional : Max. 12CHs)
 - Speed Range : 0~120km/h
 - Path Delay : 100ns~10μs (Resolution : 100ns)
 - Path Loss : 0~-25dB (Resolution : 0.5dB)
- T-DMB Module (With COFDM Modulator & Band III, L-Band Up-converter) (Optional)

Stream Generation

- Generating DVB-H transport streams (TS)
- Integrated DVB-H Modulator & VHF/UHF Up converter
- Support DVB-H MPE (multiprotocol encapsulation) Stream
- Support DVB-H MPE-FEC (forward error correction) Stream
- Support DVB-H Time Slicing Stream
- Support H.264 & VC-1 Stream & WMG

User Friendly Interface

- Easier Operation By LCD Touch Panel

● DVB-H Modulator H/W Spec.

Frequency Range	50 – 862 MHz
RF Output Level	0 ~ -110dBm
Output Level Step Size	0.5dB
IFFT	4K
In-Depth Interleaver	2K, 4K
5-6-7-8 MHz Channel	
Internal Stability	2ppm
Amplitude flatness	± 0, 2 dB
MER : >40 dB in analog domain, >=43 dB in digital domain	
Constellation	QPSK, 16-QAM, 64-QAM
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
Guard Intervals	1/4, 1/8, 1/16, 1/32
DVB-H TPS	
Cell ID Selection	
Support MPE-FEC	
Support Time-Slicing	
In-Depth Interleaver (2K, 4K)	



Operating specification

Voltage :	AC 100 ~ 240V, 50/60Hz
Operating temperature :	10 to 40 degree
Operating humidity :	45 ~ 85% RH
Guaranteed temperature:	15 to 35 degree
Guaranteed humidity :	45 ~ 85% RH
Dimensions :	377(W) x 360(D) x 162(H)mm
Weight :	About 9kg

Ordering Information

Base Model	Description
DHG300	DVB-T/H Signal Generator * RF Level : 0dBm ~ -110dBm * RF Resolution : 0.5dBm * Frequency Range: 50 ~ 862MHz * Multi Modulator / Single RF

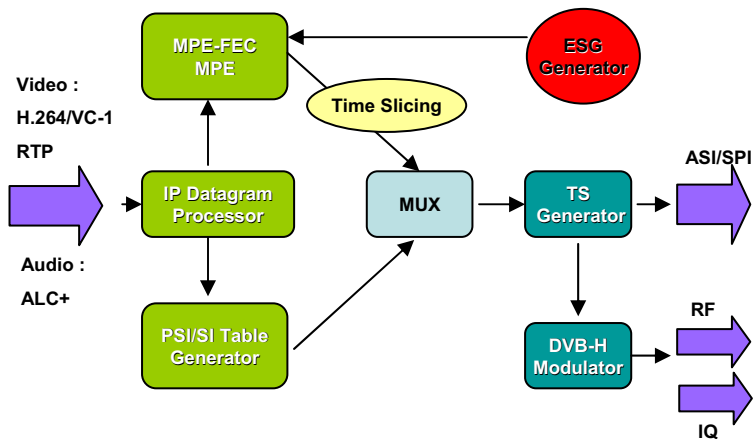
Options	Description	Notes	
Option H	H-301	T-DMB/DAB Module	
	H-302	IQ Interface Module	
Option B	B-101	ASI Out Module	* B-100 options after purchasing, it'll cost additional charges and delivery terms will be within 4 weeks.
	B-102	SPI Out Module	
	B-201	AWGN Module (-10~+30dB)	* B-201 should be combined with Base model. In case of H-301, it need additional B-201 option.
	B-202	Fading Module (Future Support)	
	B-203	GPIB Module	
	B-001	Portable Carrying Case with wheels	
	B-100	Option Upgrade Service	



DVB-H Real-Time MUX/ESG Generator – DHG2000



DVB-H Real-Time MUX/ESG Generator (DHG2000)



● Features

System

- Expert Level All-In-One DVB-H Signal Generator (RF/TS/IQ)
- All-In-One system (MPE Encapsulation + DVB-SI Generator + ESG & FLUTE Generator + Multiplexer + COFDM Modulator + RF Up-converter)
- Integrated DVB-H Modulator
- Support user friendly UI based on Windows
- Size of storage of video, audio and data (Basic160GB)
- Support C/N Generation
 - C/N Range : -10~+30dB (Resolution : 0.1dB)
 - Noise BW : ① 0~10MHz according from Signal CH BW (Spec.)
 - ② User Select : ~ Max. 45MHz
- Support Fading Simulation (Future Support)
 - 6 CHs (Optional : Max. 12CHs)
 - Speed Range : 0~120km/h
 - Path Delay : 100ns~10μs (Resolution : 100ns)
 - Path Loss : 0~-25dB (Resolution : 0.1dB)

RF

- Support RF/IQ/DVB-ASI Output (IQ output is Optional)
- RF Frequency Range : 50 MHz ~ 862 MHz
- Level Control Range : 0dBm ~ -110dBm
- Support 2K, 4K and 8K carriers, non-hierarchical and hierarchical

Data Generation and Multiplexer

- DVB-H MPE Encapsulation
- Standard DVB-H FEC Generation
- Time Slicing Generation
- PSI/SI Table (NIT, INT, PAT, PMT, SDT tables) Multiplexing into the transport stream
- Support IP sources
- Support various Time Slicing Parameter insertion
- Accurate Time Slicing Control
- Diverse Channel Editing
- RTP File and Real-time IP Datagram with using input per channel
- Extract RTP Streams (H.264, VC-1) from DVB-H streams using "DHA1000" Analyzer
- Packet Jitter Insertion per Channel (sync, cc, Transport, etc)

ESG

- ESG Generation (Edit-optional)
- ESG-FLUTE Generation
- Compose Channels with Using external ESG information
- Efficient Burst Scheduling to maximize bandwidth



● **DVB-H Modulator H/W Spec.**

- COFDM Modulator and VHF&UHF Up-converter (DVB-T)
- Output : RF / IQ (* IQ output is optional)
- RF Output Frequency : 50~ 862MHz (VHF/UHF)
- RF Output Level : 0 ~ -110dBm
- Output Level Step Size : 0.5dB
- Channel Bandwidth : 5/6/7/8 MHz
- COFDM Spectrum : 2K, 4K and 8K carriers, non-hierarchical and hierarchical
- Modulation Mode : QPSK, 16QAM and 64QAM
- Guard Interval : 1/32, 1/16, 1/8 and 1/4
- Code Rate : 1/2, 2/3, 3/4, 5/6, 7/8
- DVB-H TPS
- Cell ID Selection
- Support MPE-FEC
- Support Time-Slicing
- In-Depth Interleaver (2K, 4K)

Operating specification	
Voltage :	AC 100 ~ 240V, 50/60Hz
Operating temperature :	10 to 40 degree
Operating humidity :	45 ~ 85% RH
Guaranteed temperature:	15 to 35 degree
Guaranteed humidity :	45 ~ 85% RH
Dimensions :	519.7(W) x 435(D) x 231.8(H)mm
Weight :	About 17kg

Ordering Information

Base Model	Description
DHG2000	DVB-H Real-Time MUX/ESG Generator * RF Level : 0dBm ~ -110dBm * RF Resolution : 0.5dBm * Frequency Range: 50 ~ 862MHz * Multi Modulator /Single RF

Options		Description	Notes
Option H	H-301	T-DMB/DAB Module	
	H-302	IQ Interface Module	
Option B	B-101	ASI Out Module	* B-100 options after purchasing, it'll cost additional charges and delivery terms will be within 4 weeks.
	B-102	SPI Out Module	
	B-201	AWGN Module (-10~+30dB)	* B-201 should be combined with Base model. In case of H-301, it need additional B-201 option.
	B-202	Fading Module (Future Support)	
	B-203	GPIB Module	
	B-001	Portable Carrying Case with wheels	
	B-100	Option Upgrade Service	



DVB-H Signal Analyzer – DHA1000

● Features



<DHA1000>

- Real-time and Deferred-time Analysis of DVB-H Transport Streams
- Automatic Bit rate Calculation
- Summary data view
 - RF Parameter check
 - : Constellation / FFT / FEC / Guard Interval/SNR/BER/ FIB_CRC/TS_PER/MFER/RSSI/InBandPower/Carrier Offset
 - Check DVB-H factor
 - : MPE, MPE-FEC, ESG, FLUTE, Time Slice, INT
 - Delta_t jitter of Burst PIDs
 - Detection of DVB-H Service In Transport Stream
- DVB-H data de-encapsulation (Extracts and analyzes DVB-H contents in real-time)
- Bit rate Measurement of Each PID
- PSI/SI Table Analysis (PAT, PMT, CAT, TSDT, NIT, BAT, SDT, INT, TDT, TOT)
- Interpretation of INT Table (IP/MAC notification table)
- Analysis of TS Descriptor on DVB-H Service
- DVB-H time slice Analysis
- Delta T Jitter Analysis
- Analysis of Multicasting Address & Port Number (IP Datagram)
- Extract RTP Streams (H.264, VC-1) from DVB-H streams
- DVB-H MPE-FEC Analysis, Padding Column Analysis
- MPE and MPE-FEC section header Interpretation interpreter (real-time parameters, information regarding the padding columns parameters and the MAC address)
- FLUTE Analysis (TSI, TOI, Interval etc)
- ESG Analysis
- ESG HTML Display (Service Viewing)
- Support ESG XML and SDP file Extraction
- Support H.264, AAC Decoding, Decoding Information, SDP file Analysis
- CRC Error Monitor of INT Table
- Error Monitoring (MPEG2 Error)
- DVB-H Specific Error Monitoring (Future Support)

[Input]

Off-Line : File (DVB-H Transport Stream with ESG)

Real-Time

- RF : DVB-T/H Demodulator
- ASI / SPI interface



Summary View



Time Slice View



ESG Analysis View



Ordering Information

Base Model	Description
DHA1000	DHA1000 S/W + Professional DVB-H receiver + Hand-Held Frame + Carrying bag

Options		Description	Notes
Option HA	HA-102	GPS Field Test Module	Not supported yet
Option B	B-100	Option Upgrade Service	* B-100 options after purchasing, it'll cost additional charges and delivery terms will be within 4 weeks.



DVB-H Signal Analyzer – DHA100

● Features



<DHA100>



<Ultra Rugged Frame - Optional>

- Real-time and Deferred-time Analysis of DVB-H Transport Streams
- Automatic Bit rate Calculation
- Summary data view
 - RF Parameter check
 - : Constellation / FFT / FEC / Guard Interval/SNR/BER/ FIB_CRC/TS_PER/MFER/RSSI/InBandPower/Carrier Offset
 - Check DVB-H factor
 - : MPE, MPE-FEC, ESG, FLUTE, Time Slice, INT
 - Delta_t jitter of Burst PIDs
 - Detection of DVB-H Service In Transport Stream
- DVB-H data de-encapsulation (Extracts and analyzes DVB-H contents in real-time)
- Bit rate Measurement of Each PID
- PSI/SI Table Analysis (PAT, PMT, CAT, TSMT, NIT, BAT, SDT, INT, TDT, TOT)
- Interpretation of INT Table (IP/MAC notification table)
- Analysis of TS Descriptor on DVB-H Service
- DVB-H time slice Analysis
- Delta T Jitter Analysis
- Analysis of Multicasting Address & Port Number
- Extract RTP Streams (H.264, VC-1) from DVB-H streams
- DVB-H MPE-FEC Analysis (Padding Column Analysis)
- MPE and MPE-FEC section header Interpretation interpreter (real-time parameters, information regarding the padding columns parameters and the MAC address, 2P, UDP, RTP, RTSP)
- FLUTE Analysis (TSI, TOI, Interval etc)
- ESG Analysis
- ESG HTML Display (Service Viewing)
- Support ESG XML and SDP file Extraction
- Support H.264, AAC Decoding, Decoding Information, SDP File Analysis
- CRC Error Monitor of INT Table
- Error Monitoring (MPEG2 Error)
- DVB-H Specific Error Monitoring (Future Support)
- Live Recording
- Container Analysis (CBMS, BIM supported)
- Error Detail Analysis

[Input]

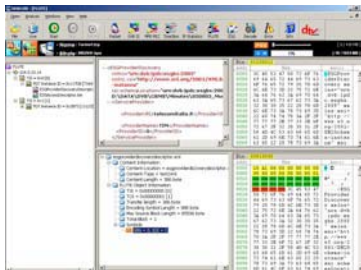
Off-Line : File (DVB-H Transport Stream with ESG)

Real-Time

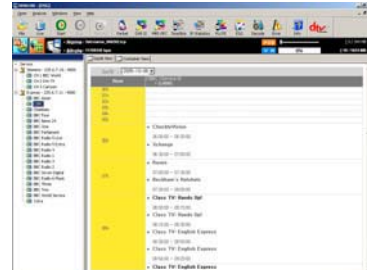
- RF : DVB-T/H Demodulator
- ASI / SPI interface



Time Slice View



FLUTE Analysis View



ESG Analysis View



Ordering Information

Base Model	Description
DHA100	DHA100 S/W + Portable Frame

Options		Description	Notes
Option HA	HA-101	Live Signal Input Module	
Option B	B-100	Option Upgrade Service	* B-100 options after purchasing, it'll cost additional charges and delivery terms will be within 4 weeks.



DVB-H Field Capture system – DHC100



● Overview

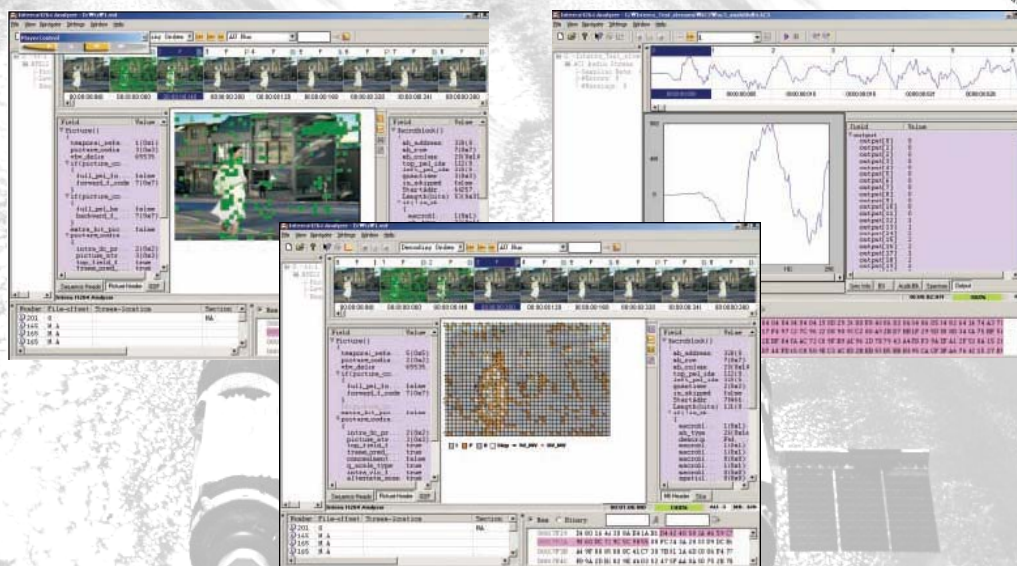
DTVinteractive's DVB-H Field capture system (DHC100) is the most effective DVB-H signal capture system for DVB-H field engineers. You can receive and record live DVB-H services available free on air with cost-effectiveness.

DHC100 supports auto-scanning and **packet error checking** for easy and perfect DVB-H signal recording. It enables user to check the status of captured TS after recording

● Features

- Real-time DVB-H TS recording from RF Demodulator
- Channel Auto-Scanning
- Display Terrestrial Delivery system (FFT, FEC, Guard Interval)
- Easy Graphical User Interface





DVB-H H.264 Analyzer - ESA100



Overview

Addressing the needs of media professionals to debug and optimize digital-video products, DTVinteractive's H264 Analyzer provides detailed Analysis of video and audio streams. Reducing development time and costs, and increasing productivity, the analyzer enables media professionals to quickly bring to market high quality and standard-compliant digital video products. The analyzer is an ideal tool for media professionals who need to:

- Verify a stream's compliance with the defined standard
- Debug an encoded stream, or optimize a stream's buffer requirements
- Evaluate and compare the performance and quality of video compression/decompression tools
- Optimize and refine video compression CODEC
- Check interoperability issues

Standards Supported

Video: H.264, MPEG-4, and MPEG-2

Audio: AAC, Dolby AC-3, and AMR

system streams: MPEG-2 Transport, MP4, 3GPP, and AVC

Standard-specific Features

H.264

- Support Baseline, Extended, and Main profiles and all levels within these profiles. Also, support High, High 10, High 4:2:2, and High 4:4:4 profiles
- Support all tools, such as CABAC, CAVLC, MBAFF, and PAFF
- Display Macroblock, Slice, NAL unit, and binary data for each picture
- Display frame statistics to analyze interpolation, prediction mode, coded bits, and frame size
- Generate encoder performance and quality metrics graphs
- Performs buffer Analysis: CPB



MPEG-4 Video

- Support Simple (levels 0-3) and Advanced Simple Profiles, Basic and Advanced tools
- Perform buffer Analysis: VBV, VMV, VCV
- Display the VOL, VOP, Short Video Header, and binary data for each picture
- Generate encoder performance and quality metrics graphs, such as Quantizer distribution, Picture Size distribution.

MPEG-2 Video

- Support Simple and Main Profiles and all levels
- Perform buffer Analysis: VBV
- Display Sequence, Picture, and Macroblock Header, and binary data for each picture
- Generate encoder performance and quality metrics, such as Quantizer distribution, Picture Size distribution

AAC/Dolby AC-3/AMR Audio

- Support AAC-Main and AAC-LC profiles. Also support AAC+Ver1 and AAC+Ver2 profiles
- Support all channel elements including SCE, CPE, LFE, and CCE
- Display ADIF headers, PCE, Raw Data Block details
- For all RDBs, display ICS info, spectral data, pulse data, scale factors, sections, and output data
- For Dolby AC-3 support tools, such as Synchronization & Error Detection, Decoupling, and Dynamic Range Compressions
- For AMR, display the Header, Auxiliary, and Core Frame structures

MP4/3GPP/AVC File Formats

- Display the file hierarchy and tracks in a tree view
- Display atom/descriptor list cross-linked with the hex/binary view
- Provide the facility to analyze the selected individual track from the tree view

MPEG-2 Transport

- Support detailed Analysis of audio/video stream carried over MPEG-2 Transport streams
- Display MPEG-2 Transport Stream hierarchy in a tree view
- Display Transport Packet Header, PES Packet Header, and PSI fields

Input Formats & Standards Supported

Video

- H.264 (ISO/IEC 14496-10)
 - Fidelity Range Extensions Amendment to ITU-TRec. H.264 | ISO/IEC 14496-10
- MPEG-4 (Part 2 (ISO/IEC 14496-2))
- MPEG-2 (ISO/IEC 13818-2:1995 and Amendment –1999-03-01)

Audio

- AAC (ISO/IEC 14496-3 sub part 1 and 4, Amendment 1)
- Dolby AC-3 (A/52, A/52A)
- AMR (3GPP TS 26.101 V5.0.0)

system Layer

- MP4/AVC (ISO 14496-1 and ISO 14496-12)
- 3GPP (TS 26.244 V6.0.0)
- MPEG-2 Transport (ISO/IEC 13818-1 and ISO/IEC 13818-1:2000/Final Draft Amendment 3)

