

DVB-T and Multistandard TV generator



- ▶ Generates digital and analogue TV signals
- ▶ Output at channels 21 to 69
- ▶ DVB-T 2k and 8k
- ▶ Multi-standard and multi-system analogue TV
- ▶ MPEG-2 output available in SPI and ASI format
- ▶ 37 patterns with moving logo
- ▶ External analogue and digital audio / video inputs
- ▶ RS-232 remote operation

The **GV-999 DVB-T** and multistandard TV signal generator is a system composed of a multi-standard TV signal generator with MPEG output and a DVB-T signal modulator with professional features.

The system is designed to meet in a single unit all the testing requirements of today's television market. It allows the test of any television set, DVB-T set top boxes and integrated DVB-T receivers.

This package solution includes the top features of the **GV-898+** Vestigial Side Band TV generator combined with a professional type modulator. The signal generator have a wide selection of

functions for an instrument of this type, including the possibility to generate YPb Pr signals, multistandard and multisystem, 37 different patterns, 16:9 and 3:4 formats, VITS & WSS, teletext, VPS and PDC. All common interface connectors such as S-VHS or SCART are available; the RS-232 interface is specially useful being bidirectional to control the instrument and the data exchange. Output level of up to 80 dBmV with a progressive attenuation in steps of 1 dB. The MPEG-2 transport stream output can drive the modulator's input to produce a DVB-T compliant COFDM signal in accordance with the rules for channel coding and modulation specified in the DVB-T standard ETSI EN 300 744.

Modulator technical details

Terrestrial digital TV signal modulator

GV-999 delivers the COFDM spectrum on a IF between 35 and 37 MHz with user defined output channels from 30 MHz to 1 GHz, preset for ITU channels from channel 21 to channel 68. Inverted/non-inverted spectrum is selected on the front panel. The spectrum bandwidth may be user configured to 8 / 7 / 6 MHz as required. This flexibility will allow the user to interface the IF signal to other than **GV-898+** frequency converters.

The **GV-999** unit has two MPEG-2 inputs (ASI format). Switching between the two inputs can be done manually and automatically. The latter option provides neat seamless switching to a secondary transport stream incase the primary transport stream source fails (a truly valuable feature for broadcast applications.) The user can configure the basic version to any transmission mode listed in ETSI EN 30 744 (excluding hierarchical mode and SFN mode.)

SPECIFICATIONS	Modulator
Signal processing	
Bandwidth	MFN network mode: 8 MHz and 7 MHz SFN and MFN network modes: 8 MHz, 7 MHz and 6 MHz
IFFT	2K, 8K
Guard intervals	1/4, 1/8, 1/16, 1/32
Code rates	1/2, 2/3, 3/4, 5/6, 7/8
Constellations	QPSK, 16-QAM, 64-QAM
Electrical specifications	
MPEG-2	Two ASI inputs, BNC 75 Ω
Clock reference	BNC connector, 10 MHz frequency, 50 Ω - >1 k Ω user selectable impedance
Time reference (SFN timing)	BNC connector, 1 PPS frequency, 50 Ω - >1 k Ω user selectable impedance
Output (standard version)	
Connector	BNC 50 Ω
Centre frequency	Adjustable 35-37 MHz in steps of 1 Hz
Frequency stability	Intern ref 1ppm or in accordance with extern ref accuracy
Spectrum polarity	Inverted and non-inverted selectable via front panel menu
Level	From 8 dBm / 2 dBm step 0.1 dB
Stability	± 0.2 dB
Spectrum outside band (*)	
± 3.8 MHz	0 dB
± 4.25 MHz	< 48 dB
± 5.25 MHz	< 56 dB
Test modes	
Removal of one carrier	Moveable one-carrier hole for noise test. COFDM spectrum replaced by a single carrier at centre frequency. The level of the single carrier is equivalent to average RMS level of normal COFDM spectrum. The signal is intended for level alignment.
Removal of 50 carriers	Moveable 50-carrier hole for test of IM and quantisation noise
TS-Stuffing	PRBS sequence in accordance with ETR290 paragraph 9.16.1
Pre-correction	Control of the peak power clip level (range +17 dB to +7 dB peak power relative to average RMS level)
Non-linear correction	
Curve formats	S21 and VO/VI
Amplitude scale	Linear and logarithmic
Correction points	Max 256, user-defined position
Correction	Max 12 dB (gain), -6 to +30 degrees (phase) subject to available headroom
Linear correction	
Correction points	21
Point spacing	1/20 of nominal spectrum BW
Amplitude	± 10 dB correction, 0.01 dB resolution
Group delay	± 1000 ns correction, 1 ns resolution
Control interface	
Front panel	LCD display and cursor / execute keys
RS-232 interface	9-pin SUB-D male connector, SCPI based command protocol
RS-485 console & CL1	9-pin SUB-D male connector, SCPI based command protocol
Alarm interface	9-pin SUB-D female connector
Output	Two user programmable alarms via separate floating relays
Input	Separate reset control and output muting control, activated by ground closure
Ethernet interface	RJ45 connector, web browser remote control or SNMP
Power Supply	
Voltage	90-132 VAC / 180-250 VAC, 47-63 Hz
Consumption	Max 25 VA
Mechanical features	
Dimensions	W. 483 x H. 44 x D. 483 mm
Weight	6 kg.

(*): Frequencies are relative to centre frequency for 8 MHz version (scale down by 7/8 and 6/8 for 7 MHz and 6 MHz versions respectively). Levels are measured in 10 kHz bandwidth, where 0 dB is the level of the carriers at the edge of the spectrum. Harmonics and spurious not included.

SPECIFICATIONS	TV GENERATOR									
System & Standard	PAL B/G/D/K/I/M/N, SECAM B/G/D/K/L, NTSC M									
Video Carrier Resolution Tuning	50 kHz By channels or by frequency (CCIR, STDL, OIRT, FCC)									
Pattern charts	37									
Front panel outputs RF Output level Frequency range	80 dB μ V, attenuation up to 60 dB in 1 dB steps 35 to 900 MHz VSB modulated									
MPEG-2 Outputs Bitrate Video Audio	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">SPI</th> <th style="width: 50%; text-align: center;">ASI</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">TS parallel</td> <td style="text-align: center;">TS serial ASI</td> </tr> <tr> <td colspan="2" style="text-align: center;">VBR for MPEG; CBR for TS</td> </tr> <tr> <td style="text-align: center;">ISO/IEC 13818-2 MP@ML</td> <td rowspan="2" style="text-align: center;">DVB-ASI EN/ISO/IEC 13818-1</td> </tr> <tr> <td style="text-align: center;">ISO/IEC 11172-3 (MPEG audio) Layer 1/2 - 44,1 kHz</td> </tr> </tbody> </table>	SPI	ASI	TS parallel	TS serial ASI	VBR for MPEG; CBR for TS		ISO/IEC 13818-2 MP@ML	DVB-ASI EN/ISO/IEC 13818-1	ISO/IEC 11172-3 (MPEG audio) Layer 1/2 - 44,1 kHz
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TS parallel	TS serial ASI									
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ISO/IEC 13818-2 MP@ML	DVB-ASI EN/ISO/IEC 13818-1									
ISO/IEC 11172-3 (MPEG audio) Layer 1/2 - 44,1 kHz										
Composite video	BNC connector, 1 Vpp voltage, 75 Ω impedance									
Rear panel outputs Blackburst RGB YPbPr S-VHS Synchronisms SCART	75 Ω , negative polarity, BNC connector 75 Ω , 0.7 Vpp amplitude, BNC connector 0.7 Vpp amplitude, BNC connector 75 Ω , 1.3 Vpp (lum.) amplitude - 0.3 Vpp (crom.) CS, horizontal pulse, vertical pulse									
Teletext	Index page and 4 data pages in 4 different languages									
Logotypes	2 independent, positionable logos, analogical & MPEG									
Audio Mono Dual-Stereo Zweiton Dual-Stereo NICAM	4,5 - 6,5 MHz, AM-FM-NICAM modulation 4,724212 - 6,2578125 MHz, FM modulation 5,850 - 6,552 MHz, modulaci3n 4QPSK									
Inputs	Video & audio									
PDC (Program Delivery Control) Systems Content	PAL B/G/I/D/K ON/OFF selectable Selectable START, STOP and PAUSE; time, country									
VPS Systems Content	PAL B/G/D/K, ON/OFF selectable Selectable START, STOP and PAUSE; time, country									
WSS (Wide Screen Signaling) Systems Content	PAL B/G/I/D/K Eight combinations for 4:3,14:9 and 16:9 formats									
Power supply Mains voltage Consumption	110-125-220-230/240 V AC \pm 10%, 50-60 Hz 40 W									
Mechanical features Dimensions Weight	W. 288 x H. 102 x D. 307 mm 5.8 kg.									