CG-1000

Master Clock Generator

The CG Series master clock generators are based on a high-precision crystal oscillator with jitter management and glitch-free relocking for ultra-high clock precision. The CG-2000 is designed for the needs of broadcasting and post production, the CG-1800 for small to large-scale video/audio synchronization systems, and the CG-1000 for recording studios, live sound applications and professional musicians.

The crystal oscillator is the heart of the clock generator. In each model of the CG Series, an OCXO (oven-controlled crystal oscillator) is used for its high precision, and the fact it is not influenced by the temperature of the environment. Boasting a clock frequency precision of 0.01 ppm[*1], which exceeds that of a TCXO (temperature-compensated crystal oscillator), these units are key in the creation of high-precision synchronization systems with word output frequency stability of ±0.005 ppm or less per day. Each model is equipped with an input connector that supports a 10-MHz signal. This allows it to be connected to a rubidium clock or GPS clock for even higher precision.

External clock jitter is reduced using an original Tascam circuit design that incorporates a high-performance video clock generator engineered with a FPGA[*2] and a PLL (phase-locked loop) circuit with a discrete filter. This enables a stable clock signal to be provided to the video/word outputs for improved system stability. The glitch-free relock circuit prevents noise and skipping sounds caused by master clock dropouts.

In addition to twelve word clock outputs and four video outputs (CG-2000 and CG-1800 only), the digital outputs include two AES3/AES11 and two S/PDIF outputs, making the units useful for large-scale audio/video synchronization systems, and a wide variety of other applications. Of the twelve word outputs, two also support x2Fs, x4Fs and 256Fs output for use in systems with ProTools and other DAW software.

The CG Series has multiple functions to support maintenance, and the identification of issues if problems occur. The analyzer function measures output device termination, input level measurement (both for CG-2000 and CG-1800 only), and the measurement of input frequencies. These built-in features enable the devices to provide troubleshooting support. Additionally, a logging function allows issues to be listed, and saved to a CSV file format on a USB flash drive. Since crystal oscillators change over time, regular calibration is necessary. In order to avoid possible sync problems, timely inspections along with regular maintenance is required. For this purpose, the CG Series has a self-calibration function, enabling users to conduct maintenance using an external input signal[*3] and simple operations.

Amphenol BNC connectors on the chassis use nuts for coupling, making them very durable. Also, a single circuit board is used for each connector providing excellent resistance to the twisting and pulling of cables, and the suppression of interference between connectors.

The CG Series is the latest in the line of innovative Tascam professional digital products – engineered with the latest digital clocking technology.

*1 Factory default value

*2 FPGA (Field Programmable Gate Array)

*3 Use of the self-calibration function requires preparation of a separate PPS-output 10MHz oscillator with a built-in GPS antenna.

Features at a glance

- A series of highly reliable, highly stable and highly accurate master clock generators
-
- **CG-1000** for recording studios, sound engineers and professional musicians not requiring video sync
  - High-quality OCXO (Oven Controlled Crystal Oscillator) oscillator for highly accurate clock signal generation not influenced by the temperature of the environment
  - Frequency accuracy: ±0.01 ppm, frequency stability: ±0.05 ppm/day
  - Jitter management circuit and glitch-less relock management to avoid problems caused by master clock signal
  - Clock input supports clock rates up to 10 MHz
  - 12 wordclock outputs, 2 AES3/AES11 outputs, 2 SPDIF outputs
  - 2 wordclock outputs support Fs/4, Fs/2, 2 Fs, 4 Fs and 256 Fs to be used with ProTools and other DAW software
  - Self-calibration function* allows maintenance by operator for optimum accuracy at any time
  - Output levels of the wordclock connectors can be adjusted
  - Analyzer feature allows to measure input frequencies
  - Logging function for troubleshooting (check the log on the display or capture a CSV-format file on a USB flash drive)
  - Up to 4 system settings can be saved for recall and saved settings can be imported and exported via USB
  - Panel-lock to prevent misoperation
  - Organic EL display with a wide viewing angle
  - Firmware updates possible using the USB port

Specifications

Inputs and outputs

WORD/EXT INPUTS	BNC connector
Input level	0.5–5.0 Vp-p
Input impedance	75/50 Ω (can set to 75/50/OFF in menu)
Supported frequencies	WORD CLOCK: 32/44.1/48/88.2/96/176.4/192 kHz
	(−4/−0.1/0.0/+0.1/+4% PULL UP/DOWN supported only when 48/96/192 kHz selected)
	ATOM: 10.0 MHz
	GPS: 10.0 MHz
Permitted frequency deviation	±10 ppm
AES3/11 INPUT	XLR-3-31 (1: GND, 2: HOT, 3: COLD)
Input level	0.2–10 Vp-p
Input impedance	110 Ω
Format	AES11-2003, AES3-2003, IEC60958-4
Supported frequencies	32/44.1/48/88.2/96/176.4/192 kHz
	(−4/−0.1/0.0/+0.1/+4% PULL UP/DOWN supported only when 48/96/192 kHz selected)
Permitted frequency deviation	±10 ppm
CALIBRATION INPUT	BNC connector
Input level	0.5–5.0 Vp-p
Input impedance	50 Ω (can turn ON/OFF in menu)
Supported frequencies	ATOM: 10.0 MHz
	GPS: 10.0 MHz, PPS
WORD OUTPUTS	BNC connector
Output level	1.0–3.5Vp-p (can set by 0.5V steps in menu)
Output impedance	75 Ω
Supported frequencies	32/44.1/48/88.2/96/176.4/192 kHz
	11.2896/12.288 MHz (Super Clock, only connectors 11/12)
	(−4/−0.1/0.0/+0.1/+4% PULL UP/DOWN supported only when 48/96/192 kHz selected)
AES3/11 OUTPUTS	XLR-3-32 (1: GND, 2: HOT, 3: COLD)
Output level	2.5 Vp-p
Output impedance	110 Ω
Format	AES11-2003, AES3-2003, IEC60958-4
Supported frequencies	32/44.1/48/88.2/96/176.4/192 kHz
S/PDIF OUTPUTS	RCA pin jack
Output level	0.5 Vpp
Output impedance	75 Ω
Format	IEC 60958-3 (SPDIF)
Supported frequencies	32/44.1/48/88.2/96/176.4/192 kHz
	(−4/−0.1/0.0/+0.1/+4% PULL UP/DOWN supported only when 48/96/192 kHz selected)
ALARM OUTPUT (CG-2000 only)	6-pin Euroblock connector
Output format	Open collector
Output impedance	10 Ω
Dielectric strength	20 V
Maximum output current	50 mA

Performance

Internal oscillator	OCXO (oven-controlled crystal oscillator)
Permitted frequency deviation	±0.01 ppm (Adjusted value when shipped new from the factory)
Frequency temperature characteristics	±0.05 ppm (0 to 40 ºC)
Long-term frequency stability	±0.005 ppm (daily)
	±0.5 ppm (annually)

Power supply and other specifications

Power	100–240 V
Power consumption	10 W
External dimensions (w × h × d)	483 mm × 44 mm × 310mm
Weight	3.1 kg
Operating temperature range	0–40 °C

Design and specifications subject to change without notice.
Page last modified: 2024-06-06 17:33:04 UTC

TEAC Europe GmbH

Bahnstrasse 12
65205 Wiesbaden
Germany
Tel: +49 611 7158-0