

Passive Hydrogen Maser VCH-1008

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The VCH-1008 Passive Hydrogen Maser is a compact hydrogen maser with excellent frequency stability and utilises state-of-the-art technology. Full digital processing of the modulation and servo loop signals makes it ideal for high accuracy applications. An internal GPS/GLONASS option is available and provides automatic output signal frequency calibration.

Key applications:

- National Time Keeping Service.
- Space tracking and navigation.
- Verification of frequency signals.
- Scientific research.

Specifications

Output signals:

Sine: 5 MHz; 10 MHz; 100 MHz, (1 ± 0.2) V RMS into 50 Ω load.

Pulse: 2,048 MHz (square pulse), $1,5 \div 2,8$ V (pp) into 75 Ω (ITU-T G.703 part15).

1Hz; 1/60 Hz, positive polarity pulse, width 100 ± 0.1 ; 10 ± 0.01 ; 1 ± 0.01 ; 0.1 ± 0.01 μ s, TTL level at 50 Ω , rise time: <10 ns.

Metrological characteristics are given in the table:

	1 s	$\leq 5.0 \cdot 10^{-13}$
	10 s	$\leq 2.0 \cdot 10^{-13}$
	100 s	$\leq 5.0 \cdot 10^{-14}$
	1 hour	$\leq 9.0 \cdot 10^{-15}$
Frequency stability (Allan deviation at $25 \pm 0.5^\circ\text{C}$, environmental effects are excluded)	1 day	$\leq 4.0 \cdot 10^{-15}$
Relative frequency accuracy	$\pm 3 \cdot 10^{-13}$ (factory calibration)	$\pm 1 \cdot 10^{-13}$ (in option with GPS calibrator)

Output signals frequency corrector	resolution	$1 \cdot 10^{-15}$
	tuning range	$1 \cdot 10^{-10}$
Phase noise spectral density (dBc/Hz) (5 MHz output)	Frequency offset	Spectral density (dBc/Hz)
	1 Hz	≤ -105
	10 Hz	≤ -130
	100 Hz	≤ -145
	1000 Hz	≤ -155
	10000 Hz	≤ -155
Frequency drift (after 1 year of unperturbed, continuous operation, temperature variation no more $\pm 1\text{C}^\circ$, environmental effects are excluded)	$\pm 2.0 \cdot 10^{-15}$ per day	
Time synchronization to UTC using GPS/GLONASS	≤ 50 ns (in GPS/GLONASS option)	
Temperature sensitivity in temperature operating range (5–35 C°)	$\leq 2 \cdot 10^{-14}$ 1/C°	
Magnetic sensitivity	$\leq 1 \cdot 10^{-14}$ 1/Oersted	

Digital control and monitoring: all operating parameters available remotely (Windows/Linux).

Interface: RS-232C; USB; LAN.

Power supply: AC(100÷240)V, (50÷60)Hz; DC(22÷30)V.

Power consumption: 120 V·A (AC), 100 W (DC).

Options: Internal GPS/GLONASS calibrator for automatic calibration.

Dimensions (W×H×D): 470 mm×200 mm×530 mm.

Weight: 27 kg.

Warranty: 3 years (10 years extended).

Life time: 15 years.