

Passive Hydrogen Maser VCH-1025 – Vremya-ch

 vremya-ch.com/index.php/en/products-en/passivehm-en/vch-1025-en/index.html



The VCH-1025 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/BEIDOU 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÷2,8 V (amp) into 75 Ω (ITU-T G.703 part15); 1Hz (1pps out); positive polarity pulse, width 100 ± 0.01 ; 10 ± 0.01 ; 1 ± 0.01 ; 0.1 ± 0.01 μ s, TTL level at 50 Ω , rise time: <10 ns, jitter ≤ 1 ns rms.

Input signals 1 Hz (synch in), pulse width 100 ns min to 100 μ s max, rise time ≤ 50 ns.

Metrological characteristics are given in the table:

**Frequency stability (Allan deviation) 5
MHz, 10 MHz, 100 MHz**

Averaging time, τ **0.5 Hz measuring
bandwidth**

1 s	$\leq 2.0 \cdot 10^{-13}$
10 s	$\leq 7.0 \cdot 10^{-14}$
100 s	$\leq 2.5 \cdot 10^{-14}$

	1000 s	$\leq 7.0 \cdot 10^{-15}$
	1 hour	$\leq 4.0 \cdot 10^{-15}$
	1 day	$\leq 8.0 \cdot 10^{-16} *$

The stated frequency stability values are guaranteed only when the ambient temperature changes within ± 0.1 °C, in the operating temperature range, with a temperature change rate of no more than 0.3 °C/hour, no earlier than 30 days after switching on the device. *The value of frequency stability over the averaging time interval of 1 day is given taking into account the exclusion of linear frequency drift.

Relative frequency accuracy	$\pm 2 \cdot 10^{-13}$ (factory calibration)	$\pm 1 \cdot 10^{-13}$ (in option with GPS calibrator)
Output signals frequency corrector	resolution tuning range	$1 \cdot 10^{-15}$ $1 \cdot 10^{-10}$
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	$\leq 2.0 \cdot 10^{-15}$ (per day at release)	$\leq 1.0 \cdot 10^{-15}$ (per day after 1 year of continuous operation)
Time synchronization to UTC using GPS/GLONASS/BEIDOU	≤ 50 ns (in GPS/GLONASS/BEIDOU option)	
Temperature sensitivity in temperature operating range (5–40 C°)	$\leq 5 \cdot 10^{-15}$ 1/C°	

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: 100 V·A (AC), 100 W (DC).

Options: Internal GPS/GLONASS/BEIDOU calibrator for automatic calibration.

Dimensions (W×H×D): 483 mm×200 mm×550 mm.

Weight: 33 kg.

Warranty: 3 years (10 years extended).

Life time: 15 years.