


Passive Hydrogen Maser VCH-1008 – Vremya-ch

 vremya-ch.com/index.php/en/products-en/passivehm-en/vch-1008-en



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/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.

Manual for VCH-1008

- Maintenance and service manual [download](#)
- User guide [download](#)

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 (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 – 1pps in), pulse width 100 ns min to 100 μ s max, TTL level at 50 Ω , rise time \leq 50 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 | $\leq 5.0 \cdot 10^{-14}$ |
| Frequency stability (Allan deviation at $25 \pm 0.5^\circ\text{C}$, environmental effects are excluded) | 1 hour | $\leq 9.0 \cdot 10^{-15}$ |
| | 1 day | $\leq 3.0 \cdot 10^{-15}$ |
| Relative frequency accuracy | $\pm 3 \cdot 10^{-13}$ (factory calibration) | $\pm 1 \cdot 10^{-13}$ (in option with GPS calibrator) |
| | resolution | $1 \cdot 10^{-15}$ |
| Output signals frequency corrector | tuning range | $1 \cdot 10^{-10}$ |
| | Frequency offset | Spectral density (dBc/Hz) |
| Phase noise spectral density (dBc/Hz) (5 MHz output) | 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 $\pm 1^\circ\text{C}$, environmental effects are excluded) | $\pm 2.0 \cdot 10^{-15}$ per day | |
| Time synchronization to UTC using GPS/GLONASS/BEIDOU | ≤ 50 ns (in GPS/GLONASS/BEIDOU option) | |

Temperature sensitivity in temperature operating range (5–40 C°) $\leq 1 \cdot 10^{-14} 1/C^\circ$

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.