

# Passive Hydrogen Maser VCH-1008



[vremya-ch.com/index.php/en/products-en/passivehm-en/vch-1008-en](http://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,  $(1 \pm 0.2)$  V RMS into 50  $\Omega$  load.

Pulse: 2,048 MHz (square pulse), 1,5÷2,8 V (amp) into 75  $\Omega$  (ITU-T G.703 part15);

1Hz (1pps out); positive polarity pulse, width  $100 \pm 0.01$ ;  $10 \pm 0.01$ ;  $1 \pm 0.01$ ;  $0.1 \pm 0.01$   $\mu$ s, TTL level at 50  $\Omega$ , rise time:  $< 10$  ns, jitter  $\leq 1$  ns rms.

### Input signals

1 Hz (synch in), pulse width 100 ns min to 100  $\mu$ s max, rise time  $\leq 50$  ns.

Metrological characteristics are given in the table:

Frequency stability (Allan deviation at $25 \pm 0.5^\circ\text{C}$ , environmental effects are excluded)	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	$\leq 9.0 \cdot 10^{-15}$
	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)
Output signals frequency corrector	resolution	$1 \cdot 10^{-15}$
	tuning range	$1 \cdot 10^{-10}$

	Frequency offset	Spectral density (dBc/Hz)
	1 Hz	≤-105
	10 Hz	≤-130
	100 Hz	≤-145
	1000 Hz	≤-155
<b>Phase noise spectral density (dBc/Hz) (5 MHz output)</b>	10000 Hz	≤-155
<b>Frequency drift (after 1 year of unperturbed, continuous operation, temperature variation no more ±1C°, environmental effects are excluded)</b>	±2.0·10 <sup>-15</sup> per day	
<b>Time synchronization to UTC using GPS/GLONASS/BEIDOU</b>	≤50 ns (in GPS/GLONASS/BEIDOU option)	
<b>Temperature sensitivity in temperature operating range (5–40 C°)</b>	≤1·10 <sup>-14</sup> 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.