

PRECISION TIMING

TA1000 Optically-pumping Cesium Atomic Clock

The TA1000 Optically-pumping Cesium Atomic Clock delivers exceptional frequency accuracy and stability, supporting both laboratory and field applications in critical areas such as astronomy, geodesy, and military operations.

TECHNICAL SPECIFICATIONS

PERFORMANCE	
Frequency accuracy	≤1E-12
Frequency stability	≤1.2E-11 (1 s)
Frequency stability	≤8.5E-12 (10 s)
Frequency stability	≤2.7E-12 (100 s)
Frequency stability	≤8.5E-13 (1000 s)
Frequency stability	≤2.7E-13 (10000 s)
Frequency stability	≤8.5E-14 (100000 s)
Frequency reproducibility	≤5E-13
Manual sync range	±1E-9
Resolution	1E-15

ELECTRICAL	
Power voltage	22VDC~75VDC
Power voltage	220V 50Hz VAC
Power consumption	≤190W (warm-up)
Power consumption	≤110W (stable)

MECHANICAL	
Weight	≤40 kg
External dimensions	598 × 456 × 177 mm (19-inch, 4U)

ENVIRONMENTAL	
Operating temperature	-10°C to +40°C
Storage temperature	-20°C to +50°C
Warm-up time	≤40 min (+20°C)
Warm-up time	≤2 hours (-10°C)
MTBF	≥100,000 hours
Service life	≥8 years
Atmospheric pressure	≤5.0E-13 (sea level 0~3 km)

Magnetic field	$\leq 3.0E-13$ (± 1 Gauss)
Vibration	Be adapted to the 3rd class highway or railway transportation.

OUTPUT	
10 MHz output channels	2
10 MHz amplitude	7~13 dBm
10 MHz harmonic	≤ -40 dBc
10 MHz non-harmonic	≤ -80 dBc
10 MHz phase noise	≤ -90 dBc/Hz (@1 Hz)
10 MHz phase noise	≤ -125 dBc/Hz (@10 Hz)
10 MHz phase noise	≤ -140 dBc/Hz (@100 Hz)
10 MHz phase noise	≤ -150 dBc/Hz (@1 kHz)
10 MHz phase noise	≤ -150 dBc/Hz (@10 kHz)
5 MHz output channels	2
5 MHz power	7~13 dBm
1PPS rising time	≤ 10 ns
1PPS jitter	≤ 1 ns
1PPS sync accuracy	≤ 20 ns
1PPS sync input	1PPS TTL

Overview

The **TA1000 Optically-pumping Cesium Atomic Clock** is designed as an optically pumped cesium-beam frequency standard. It offers outstanding stability and accuracy for both laboratory and field environments. With a 30-day averaging time stability specification, the TA1000 ensures long-term predictable performance for applications like time synchronization, telecommunications, and high-precision measurement systems. For inquiries, please [contact us](#).

Features

- **Touch-based menu-driven operation** for ease of use.
- Advanced **optically-pumped technology** for high accuracy.
- Easy-to-read **clock and message displays**.
- Comprehensive **status monitoring** with automatic event logging.
- Supports **automatic synchronization of 1PPS signals**.
- Full **clock and frequency control** capabilities.

Main Specifications

General Specifications

Specification	Details
Frequency Accuracy	$\leq 1E-12$
Frequency Stability	$\leq 1.2E-11/1s$ $\leq 8.5E-12/10s$ $\leq 2.7E-12/100s$ $\leq 8.5E-13/1000s$ $\leq 2.7E-13/10000s$ $\leq 8.5E-14/100000s$

Specification	Details
Frequency Reproducibility	≤5E-13
Manual Sync Range	±1E-9
Resolution	1E-15
Power Voltage	22VDC~75VDC 220V 50Hz VAC
Power Consumption	Warm-up: ≤190W Stable: ≤110W
Operating Temperature	-10°C to +40°C
Storage Temperature	-20°C to +50°C
Warm-up Time	≤40min at +20°C ≤2 hours at -10°C
Weight	≤40 kg
External Dimensions	598 x 456 x 177 mm (19-inch, 4U)
MTBF	≥100,000 hours
Atmospheric pressure	≤5.0E-13/ sea level 0~3km
Magnetic field	≤3.0E-13/ ±1 Gauss
Vibration	Be adapted to the 3rd class highway or railway transportation.
Service life	≥8 years

Output Signals

Signal Type	Details
10 MHz Sine Wave	Channels: 2 Amplitude: 7~13 dBm Harmonic: ≤-40 dBc Non-harmonic: ≤-80 dBc Phase Noise: @1Hz: ≤-90 dBc/Hz @10Hz: ≤-125 dBc/Hz @100Hz: ≤-140 dBc/Hz @1kHz: ≤-150 dBc/Hz @10kHz: ≤-150 dBc/Hz
5 MHz Sine Wave	Channels: 2 Power: 7~13 dBm
1PPS TTL	Rising time: ≤10 ns Jitter: ≤1 ns Sync accuracy: ≤20 ns Sync Input: 1PPS TTL

Applications

- Calibration of counters, frequency meters, spectrum and network analyzers.
- References for DTV, DAB, VHF, UHF & PMR TX, CMDA, Tetra, and IPTV systems.
- Production test frequency standards.
- Network time protocol for financial, utilities, security, and communications.
- OEM and calibration labs, radio workshops, and test labs.