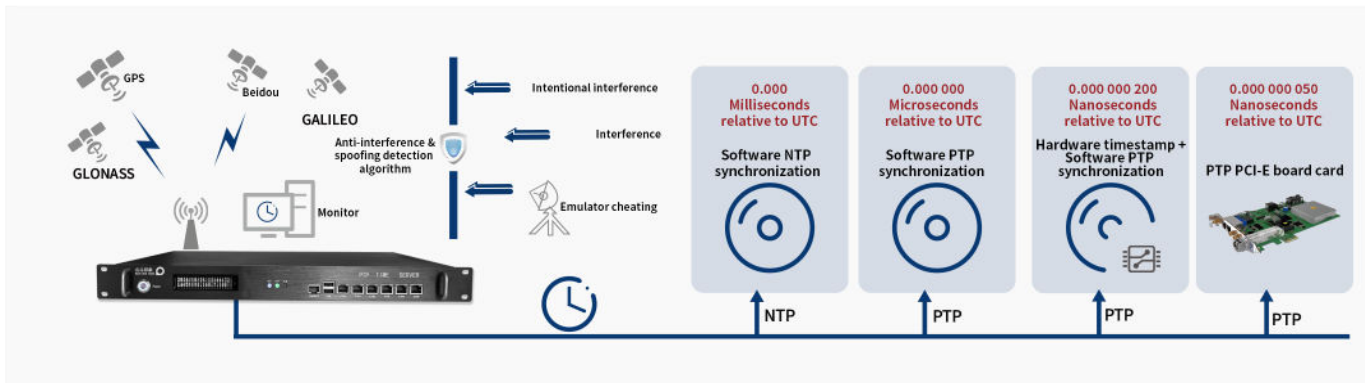


## T800 high-performance Clock server

Accurate & Safe & Easy deployment





### Important features

- The PTP + NTP protocol is supported without additional hardware support
- Less than 10 ns of client synchronization accuracy
- Support Full GNSS (GPS, Beidou, Galileo, GLONASS)
- The option supports 1G / 10G / 40G / Ethernet
- Support for 1 PPS + serial port, IRIG-B, parallel port, GPIO and PTP input
- Built-in high-performance crystal oscillator, 24 hours 8μs , / optional rubidium clock, 24 hours 200ns
- Advanced anti-jamming and deception detection algorithms
- Support the boundary clock, transparent clock and ordinary clock
- Compatible with both the IPv6 and IPv4 protocols
- The structural design is compatible with single power supply, redundant power supply or DC power supply
- Supports two layer link layer protocol and four layer UDP protocol
- Support on-demand and multicast delivery, support the best clock (BMC) algorithm
- Supports a 5 / 10 / 20 / 25 MHz frequency output
- Supported and compatible with the one step and two step measurement message mechanisms
- High-precision pps synchronization and output, used for clock transmission, verification and demonstration
- Support the domestic Kirin operating system
- The delayed measurement mode supports both the point-to-point and end-to-end modes
- Support for ordinary switches and 1588 switches
- Support pc machine, server and laptop computer
- Monitoring function of time synchronization accuracy
- Strong anti-interference capability, support a large range of dynamic time adjustment and debugging
- The whole network port supports ptp and ordinary network communication
- Support for heartbeat detection and bonding function
- Intuitive network management interface, facilitate user operation control management

### Application area

- Financial instrument
- Defense and military industry
- Power communication
- Frequency laboratory
- Industrial automation
- Big data cloud computing

### Summary

The T800 high-performance clock server, designed for high-frequency trading and other low-latency network applications, is the perfect combination of highly optimized timing protocols and clock management features.

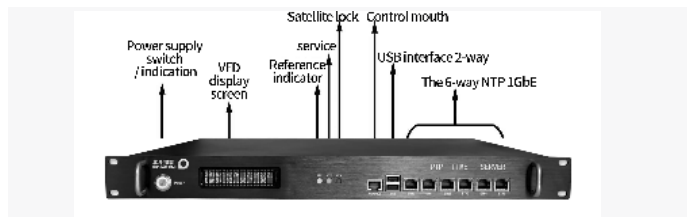
Full GNSS concurrent reception, precision clock taming algorithms, and local clocks combine to provide the flexibility and performance needed to meet the demands of evolving network architectures. The Clock Server provides multiple 1GbE(RJ-45), 10GbE(SFP+) network ports and integrates a highly accurate IEEE 1588-2008 PTP packet gateway clock and Silicon Lab Si5348 ultra-low jitter network synchronizer, compatible with SyncE standard phase and frequency synchronization, combining jitter attenuation and clock regeneration, and supporting both NTP and SNTP network synchronization protocols.

The hardware of the device is designed with redundant architecture, and the high-precision clock comes directly from the GNSS system. The clock is directly derived from the atomic clocks of the satellites in the GNSS system, and the local clock source is tamed through signal analysis, so as to realize the function of keeping the local clock accurately after the loss of satellite signals.

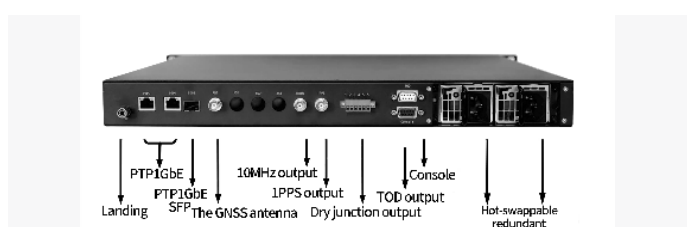
The software of the device adopts a variety of anti-jamming detection and identification algorithms of BDSTAR TIME to detect signal anomalies caused by interference and malicious attacks on GPS signals. Unique embedded hardware design, efficient Linux operating system, flexible expansion of a variety of clock signal output. At the same time support TOD,10MHz, 1PPS, logging logging, USB port upgrade and download and dry contact alarm function. With BDSTAR TIME's self-developed network time unified monitoring software, it is easy to realize network time synchronization and effective monitoring.

T800 high-performance clock server can be widely used in government, defense, finance, securities, insurance, mobile communication, cloud computing, e-commerce, energy and power, petroleum and petrochemical, industrial automation, intelligent transportation, security, smart city, Internet of things and other fields.

### Front view



### Back view



## Qualification

### Time protocol

- NTP v2,v3,v4; Conforms with RFC5905
- SNTP v3,v4: Conforms with RFC9505
- PTPv2 (telecom profile, hybrid mode)

### Satisfying criteria

- ITU-T G.8261, G.8265, G.8275
- ITU-T G.8273 T-GM, T-BC and T-TSC
- ITU-T G.8262 (SyncE) EEC Options 1 & 2
- ITU-T G.812 Type III, IV
- ITU-T G.813 Option 1
- Telcordia GR1244, GR253 (Stratum 3/3E)

### Server performance

- PTP: master-slave synchronization accuracy 10ns, user terminal synchronization accuracy 50ns (general network card)
- NTP: User terminal synchronization accuracy: 100  $\mu$  s
- Support 256 PTP unicast clients, with unlimited number of multicast clients
- NTP requests: 23,000 requests / s
- Can be connected to another clock server to form a level 2 clock

### Time GNSS receiver

- Receiver type: 72-channel professional timing type
- GPS/QZSS L1 C/A, GLONASS L1OF, BeiDou B1 , SBAS L1 C/A:  
WAAS, EGNOS, MSAS, GAGAN , Galileo E1B/C
- Data update rate: parallel GNSS up to 4Hz
  - Positioning accuracy 2.5 m CEP; cold start: 28s; auxiliary cold start 2s;
  - Time timing accuracy: 20ns
  - Sensitivity: tracking and navigation -166dBm; cold start -157dBm;

### Front panel

- The VFD high-brightness LCD screen
- It shows the status, time, number, longitude and altitude of the satellite The IP and system working status of each network card
- Three color indicator light
- Indicates whether the reference source is available, whether the clock service is activated, whether the satellite is locked, etc
- NTP network port: RJ-45, 6 channels, 10 / 100 / 1000M adaptive Ethernet interface
  - Console: RJ-45, 1 channel, RS232 level, NTP control interface
  - USB: 1 route, backup, recovery, upgrade function

### Back panel

- Antenna in: BNC, 1, road, GNSS, output 5V DCPTP
- Network port: 2 road photoelectric two choice: SFP, RJ 45
- TOD: DB-9 female, 1-way, RS232 level, time and position information
  - Console: RJ-45, 1 circuit, RS232 level, PTP control interface
  - ALARM Dry contact point alarm: 3 pairs, power supply, GPS, port capacity alarm
  - 1PPS: BNC, 1 way, 20ns accuracy

## High-performance constant temperature crystal oscillator

Item	Qualification	
Daily average accuracy	Better than 1E-12	
Frequency stability	<5E-12/s	
	<1E-11/10s	
Phase noise	10Hz	<-130dBc/Hz
	100Hz	<-145dBc/Hz
	1kHz	<-152dBc/Hz
	$\geq$ 10kHz	<-155dBc/Hz

## High-performance rubidium atomic clock (Opt-RB)

Item	Qualification	
Daily average accuracy	Better than 1E-12	
Frequency stability	$\leq$ 2E-11/s	
	$\leq$ 6E-12/10s	
	$\leq$ 2E-12/100s	
Phase noise	10Hz	$\leq$ -100dBc/Hz
	100Hz	$\leq$ -130dBc/Hz
	1kHz	$\leq$ -140dBc/Hz
	10kHz	$\leq$ -150dBc/Hz

## 1PPS Output

Item	Qualification
Output level	TTL
Pulse length	>20us
Up and down time	<10ns
Synchronous accuracy	< 20ns
Keep the accuracy	<200ns (24 Hours)

## Physical and environmental parameters

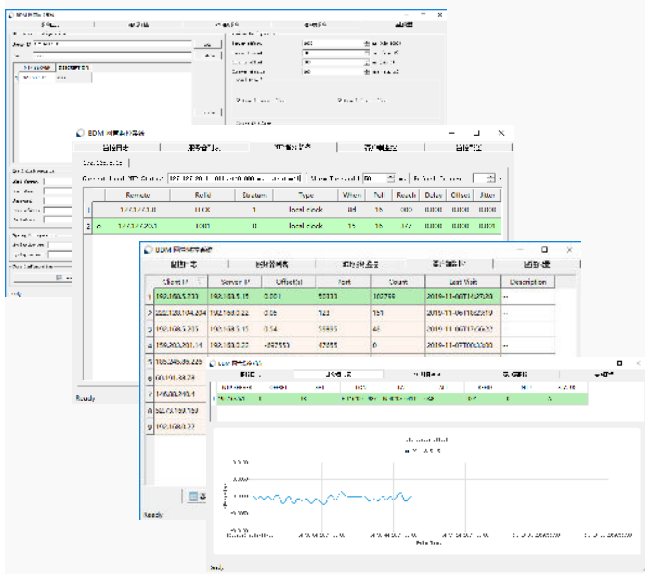
- Dimensions: 1U chassis 440×44.5×364mm
- Weight: 3 Kg
- Power supply: 2-way hot plug (Opt-P), 220V  $\pm$  20% ,47Hz ~ 63Hz
- Operating temperature: -10°C ~ + 55°C (host)  
-40°C ~ + 75°C (antenna)
- Storage temperature: -45°C ~ + 85°C
- Humidity: 95% without condensation
- Power consumption: 50W

### Software performance

#### The whole network time unified monitoring software

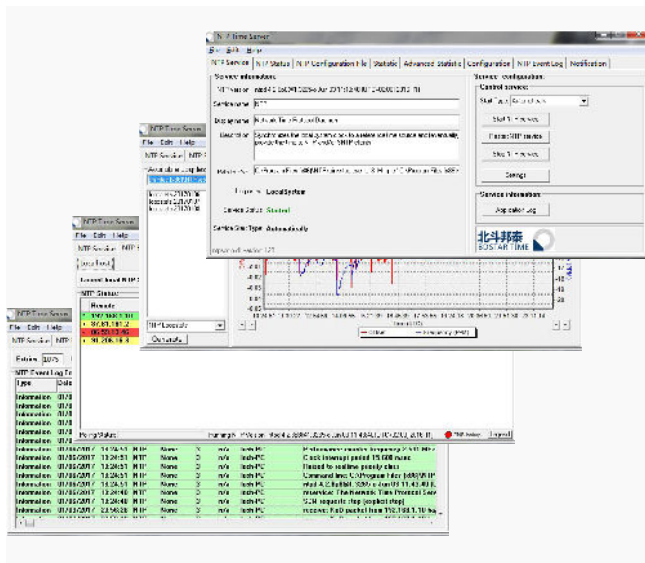
BDMonitor --BDMonitor The whole network time unified monitoring software, can monitor the satellite information, server information, client information.

Satellite information includes satellite time, lock status, number of locks, latitude and longitude, height and other information; server information includes NTP timing status, synchronization status, server time, network configuration, etc., monitoring and alarm information supports syslog, Email and other protocols or storage events to the local log. Support no less than 10000 client monitoring, and can set alarm type and alarm level according to reporting. In the monitoring software, it can directly query and configure network parameters, and has the monitoring function of rubidium clock tame / keeping, lock loss / lock in state (far and distance).



#### The NTP client synchronization software

Provide window system NTP protocol timing software, running in service mode, and provide the interface of operation state monitoring, control and configuration.



#### The SNTP client time synchronization software

Provide window system SNTP protocol timing software, support startup and tray operation, Multiple NTP time server addresses can be added, and automatically switch when NTP time server is not available.

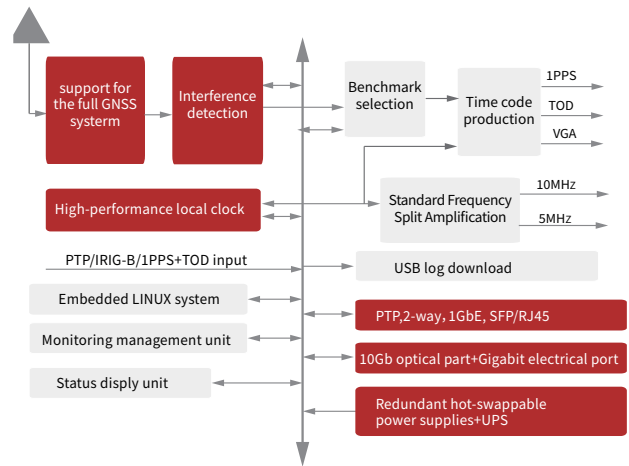
#### PTP condition monitoring

LOS, OOF, LOL

#### PTP, client

Support general X86, platform and ARM platform, support Linux, operating system and domestic Kirin operating system.

#### Composition block diagram



#### Standard configuration

- Mainframe 1 set
- 1 high-sensitivity timing antenna for 50 m cable
- Install 1 set of brackets
- 1.5 metre power cable 2 pcs
- 1.5 metre control cable 1pc
- 3 metre network cable 1pc
- 1 copy of Chinese manual
- 1 CD-ROM (Description, NTP client time synchronization software, SNTP timing software, BDMonitor network time synchronization system unified monitoring software, windows / Unix / Linux / AIX / Solaris system synchronization reference summary)

#### Selected information

Number	Description
-BDC	IRIG-B DC input
-B3	BDS/B3 Army code input
-A80-200	Standard 80 m, 150 m, 200m, antenna cable
-CA23-RP	Antenna arrester