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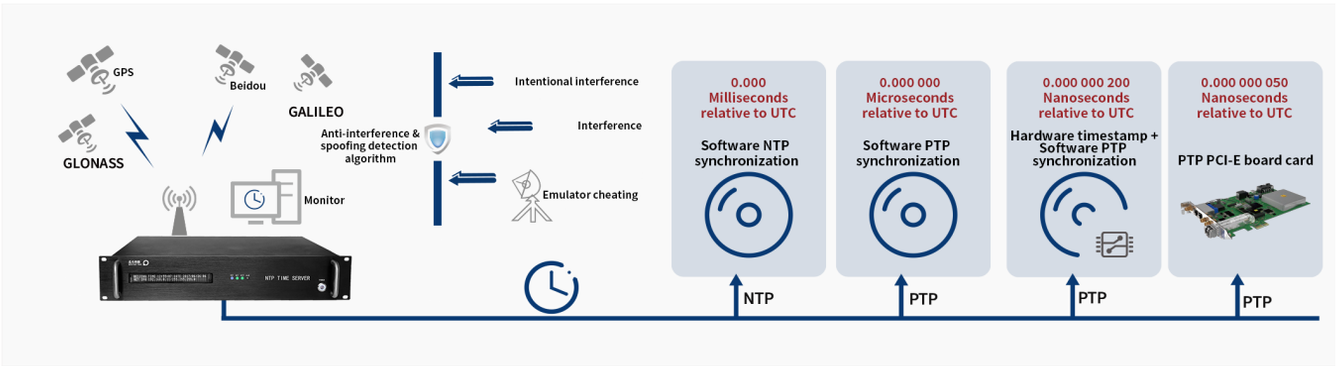
BDSTAR TIME

T680-RB PTP / NTP Time synchronization server

High-precision time synchronization for industry applications

PTP + NTP High Efficiency & China-made & Anti-interference
Monitorable & High-performance rubidium clocks &
Redundant hot-plug power supplies.

www.bdpnt.com



Important features

- Highly sensitive GNSS concurrent reception for demanding global environment
- GPS / QZSS, GLONASS, Beidou and GALILEO concurrently
- High-performance industrial-grade motherboard, embedded Linux operating system
- Provide six independent 10 / 100 / 1000 Mbs network interfaces
- Another PTP / NTP server can be connected to form a level 2 clock
- Built-in high performance rubidium atomic clock, 24 hours deviation 200 ns
- Advanced anti-jamming and deception detection algorithms
- Support for SSH, SSL, SCP, SNMP, CustomMIB, HTTPS, and Telnet
- Compatible with the IPv 6 and IPv 4 protocols
- Relative UTC time accuracy reached the nanosecond level
- Supports the SysPlex time information output required by the IBM mainframe
- The VFD ultra-wide HD vacuum fluorescent display is adapted to extreme low temperatures
- Reliability MTBF is greater than 100,000 hours
- Support for MD5 encryption protocol, certificate encryption protocol
- User interface for a secure and efficient web
- Support for 1 PPS + TOD, IRIG-B, GPIO, and PTP input
- Support 1 PPS and NMEA serial time information input
- The whole network port supports NTP + PTP protocol with no additional hardware support
- Supports two-layer link layer protocol and four-layer UDP protocol
- Support for sending and receiving timestamp and delay request-response to two message measurement mechanisms
- Support China's localized Kirin OS system
- The delayed measurement mode supports both point-to-point and end-to-end modes
- Strong anti-interference ability, to maintain a stable time synchronization performance

Important function

- Improve the accuracy of network log files and network fault diagnosis and positioning speed
- Support bonding technology, quickly achieve single-machine backup and load balancing
- Support the heartbeat detection function, and realize the two devices with the same IP for mutual backup
- Support the latest SNMP protocol, improve the network management efficiency
- Equipped with self-developed NTP service + PTP service monitoring software
- Low 50 ns of client synchronization accuracy
- Support the clock priority mechanism, which allows users to set or adjust their priorities
- Can be used with servers or switches that support the IEEE 1588 protocol
- Multiple clock types that support Master-Slave, BC, OC, and TC mode
- Support unicast, multicast, mixed mode delivery, the best clock (BMC) algorithm

Summary

T680-RB PTP / NTP time synchronization server, and PTP and NTP timing service for integration, can support NTP and SNTP network synchronization protocol, also can use PTP to provide high precision clock synchronization and timestamp function, let multiple devices through network protocol to accurate time synchronization, to achieve high performance, high available distributed system, but also can use the PTP4L daemon to monitor and evaluate the LinuxPTP time synchronization accuracy. The hardware of the equipment adopts redundant architecture design. The high-precision clock is directly derived from the atomic clock of each satellite in the GNSS system, and the local clock source is tamed through signal analysis to achieve the function of keeping the local clock accurately after the loss of satellite signals. The device software adopts a variety of anti-interference detection and identification algorithms of BDSTAR TIME to detect abnormal signals caused by interference and malicious attacks. Unique embedded hardware design, efficient Linux operating system, can flexibly expand a variety of clock signal output. Full support for the latest NTP timing protocol, MD5 security encryption protocol and certificate encryption protocol, the network time accuracy can reach the microsecond level. At the same time, it supports TOD, 10 MHz, 1 PPS, logging, USB port upgrade and download, and dry contact alarm functions. Combined with the whole network time unified monitoring software independently developed by BDSTAR TIME, it can easily realize network time synchronization and effective monitoring.

Structure of a system

T680-RB PTP / NTP time synchronization server innovatively integrates reference source seamless switching technology, high-precision time interval measurement TIC technology and adaptive precision frequency measurement and control technology. Adopt modular design, composed of Beidou receiver, GPS receiver, high-performance industrial motherboard, man-machine interface and monitoring management unit, local clock tame unit, output interface module and power module. The T680-RB PTP / NTP time synchronization server core consists of 64-bit high-performance CPU, high-speed FPGA and high stability oscillator (Rubidium atomic clock or OCXO), which uses Linux for multi-task real-time parallel processing and scheduling. The system can simultaneously receive the second synchronization and time information sent by Beidou and GPS and the network time message meeting the NTP / SNTP + PTP protocol, automatically select the external time reference signal as the synchronization source according to the priority and control it to the locked state (LOCKED).
This results in an uninterrupted output of time information synchronised with UTC

Application area

government, national defense, industry, finance, electric communication, power, scientific research, data, network, laboratory

Qualification

Time agreement

- NTP v2,v3,v4;Conforms with RFC5905
- SNTP v3,v4: Conforms with RFC9505
- PTPv2 (Linux Precision Time Protocol)
- NTP Unicast, Broadcast, Multicast, Autokey
- TIME (RFC868) FTP (RFC959) DAYTIME (RFC867) DHCP (RFC2131) RSA asymmetric encryption
- HTTP/SSL/HTTPS（RFC2616） SNMP v1,v2、
- SSH/SCP (Internet Draft) MIB ll (RFC1213)
- lPV4、lPV6、lPv4/lPv6 Hybrid

Server performance

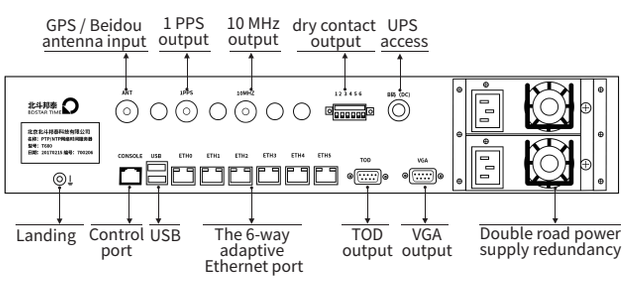
- PTP supports unicast clients, unlimited number of multicast clients
- PTP: master-slave synchronization accuracy of 20ns, terminal synchronization accuracy of 50ns (general network card)
- Time accuracy of NTP user terminal: 100 μ s (LAN typical value)
- NTP user capacity: more than 2 million units
- NTP requests: 23,000 requests / s
- Support for 10,000 entries of logging function

Time GNSS receiver

- Receiver type: the 72-channel professional timing type GPS/QZSS L1 C/A, GLONASS L10F, 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;

Back panel

- Antenna in: BNC, 1, road, GNSS, output 5V DC
- Network port: RJ-45,6 road, PTP / NTP 1G adaptive network port
- Console: RJ-45,1 channel, RS 232 level, control interface
- TOD: DB-9 female, 1-way, RS 232 level, time and position information
- VGA: DB-9 female, 1 route, display output
- ALARM Dry contact point alarm: 3 pairs, power supply, GPS, port capacity alarm
- 1 PPS: BNC, 1 road, TTL
- 10 MHz: BNC, 1 way, sine wave, amplitude 12± 1dBm, 50 Ω
- USB: 2 way, backup, recovery, upgrade function



High-performance riveting atomic clock

Item	Index	
Daily average accuracy	Better than the 1E-12	
Frequency stability	⩽ 2E - 11/s	
	⩽ 6E - 12/10s	
	⩽ 2E - 12/100s	
Phase noise	10Hz	⩽ -100dBc/Hz
	100Hz	⩽ -130dBc/Hz
	1kHz	⩽ -140dBc/Hz
	10kHz	⩽ -150dBc/Hz

Pulse output

signal	project	metric
1PPS output	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: 2U chassis 447x89x300mm
- Weight: 7 kg
- Power supply: 2 thermal plug (Opt-P), 220V,± 20% 47Hz ~ 63Hz, 1 UPS power supply
- Operating temperature: -10 °C ~ + 55 °C (main engine) -40 °C ~ + 75 °C (antenna).
- Storage temperature: -45 °C ~ + 85°C
- Humidity: 95% no condensation
- Power consumption: 60W

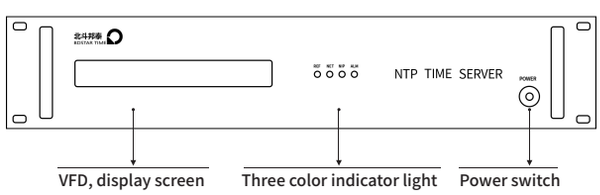
Front panel

- The VFD high-brightness LCD screen

It plays the satellite receiving status, time, number of satellites, longitude, altitude, IP and working status of the system

- Three color indicator light

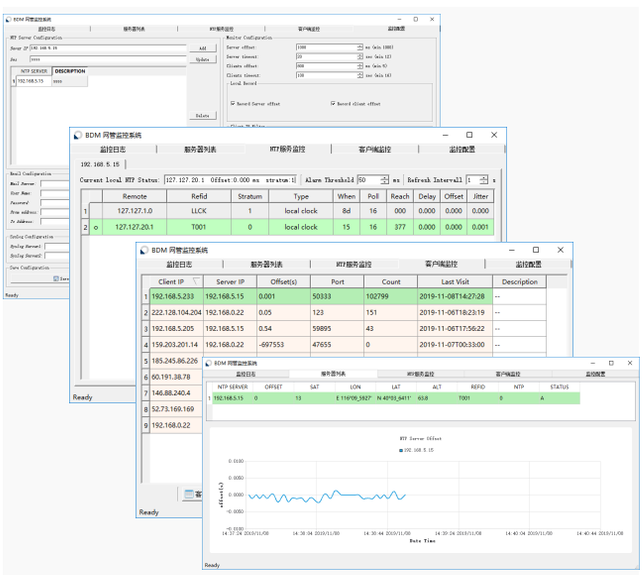
Indicates the GNSS lock status, NTP service status, local clock tame status, and equipment alarm



Software performance

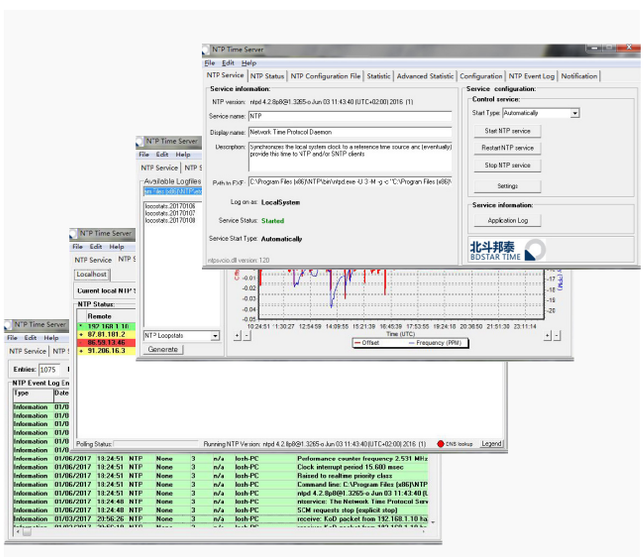
The whole network time unified monitoring software

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 PTP / 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 the network parameters, with the function of taming / holding, missing / locking state (remote) monitoring



PTP / NTP, the client synchronization software

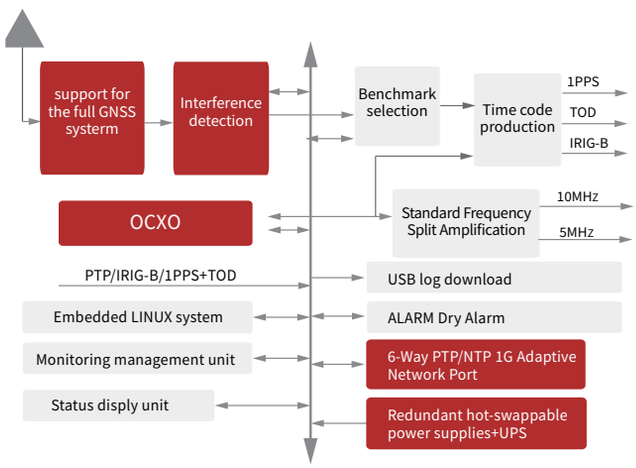
Provide the window system PTP / NTP protocol timing software, run in a service mode, and provide the operation state monitoring, control and configuration interface.



The SNTP client time synchronization software

Provide window system SNTP protocol timing software, support startup and tray operation, add multiple NTP time server addresses, and automatically switch when NTP time server is not available

Composition block diagram



Standard layout

- Mainframe 1 set
- 1 high-sensitivity timing antenna for 50 m cable
- Install 1 set of brackets
- 21.5 m power lines
- One 1.5-m control line
- 13-meter network cable
- 1 Chinese manual
- 1 disc (instruction manual, PTP / NTP configuration manual, client time synchronization software)
- SNTP timing software, BDMonitor network time synchronization system unified monitoring
- Software, windows / unix / Linux / Alx / Solaris

Selected information

number	description
-BDC	Enter the lRlG-BDC
-B3	BDS / B3 military code input
-A80-200	Standard 80m, 150m, 200m ,antenna cable
-CA23-RP	Antenna arrester

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