

## GB8005

### HIGH PRECISION 20ns BEIDOU/GPS BINARY MULTI-SOURCE TIME SERVER

The industrial grade BEIDOU/GPS Network Time Server that GFUVE GROUP manufactured are specifically for electric power system, automatizatio system, telecom system,CCTV and traffic system that need high-precise time requirer . Our system is based on BEIDOU or GPS, and the precision of time is 20ns.The facility is secondary developed with the Beidou or GPS receiver that made by the special factory. It can track 12 Beidou or GPS satellites at the same time, and selects the best satellite automaticly for locating and timing. It outputs UTC time ,and the synchronous precision is 1 $\mu$ s.The GB8005 is quite cost effective and high quality,its highest record of MTBF is 15 years. The GB8005 time synchronization system device provides accurate synchronization time signals to various power system automation devices by using the second synchronization signal and time information message sent by Beidou navigation system and GPS( Global Positioning System) satellite.

## Application

1. For relay protection device test, inspection line longitudinal protection (high frequency phase difference protection device).
2. For fault location, especially for the development of dual-terminal traveling wave ranging principle of the device to create conditions.
3. The standard clock used for frequency monitoring, means the system frequency error accumulation is compared on the schedule by the difference between the power frequency clock and the standard time.
4. The synchronous clock used for phase measurement, the BG8005 is used to synchronize the sampling pulse, and the synchronization error is very small, which can ensure the accuracy of phase measurement.
5. Providing time synchronization signals for power network automation devices such as fault recorder, event recorder, microcomputer relay protection device, microcomputer measurement and control device, merging unit, intelligent terminal and various safety automatic devices, telecontrol and microcomputer monitoring system, dispatching control system, etc.



## Features

1. GPS, BD, CDMA three signal sources can be equipped with three options and two. especially suitable for electric power, machine room, hospital, etc.
2. Software interface can be set in English and Chinese, time zone can be set, panel with keys, easy to operate.
3. All-weather signal coverage, independent two-star system each other to ensure a long continuous high-precision timing.
4. Multiple 32-bit high-speed microprocessors + large-scale integrated FPGA chips, parallel high-speed data processing and various codes, excellent performance.
5. High-precision punctuality frequency is derived from adaptive synchronization technology, closed-loop control punctuality technology to tame constant temperature crystal oscillator, to achieve long-time high-precision punctuality.
6. Automatic selection of clock source according to priority, when receiving and decoding external IRIG-B (DC) code, automatic delay compensation correction technology is used to improve timing accuracy.
7. Separate 10 M/100M network ports (each port has a separate MAC address), flexible configuration, can be used in different sub-nets or different physical isolation networks, using NTP/SNTP protocols to provide time synchronization services.
8. Having two PTP V2 high-precision timing ethernet interfaces while down-compatible with V1 protocols, telecom-level timing accuracy, support multicast and unicast transmission modes, and support the best master clock selection algorithm. (Optional)
9. Providing programmable pulse, can be set for PPS、 PPM、 PPH; to provide setable frequency output, can be set to 100 K、 1M、 2M、 5M、 10M output, flexible and convenient.
10. High performance, wide range switching power supply, AC-DC compatible input, convenient and reliable, stable operation.
11. All signal input and output interfaces are photoelectric isolation measures, safe and reliable.
12. 1U Frame structure , 19 inch standard chassis, easy installation and maintenance.

## Parameters

Parameters					
1. Output Signal					
Timing signal type	Interface Type	Timing accuracy		Interface parameters	Number of interfaces
		Beidou-1	GPS		
Pulse	TTL level	-0.14μS	-0.06μS	5V level	1 channels
Frequency	TTL level			5V level	1 channels
IRIG-B Time Code	RS485 level	0.12μS	0.2μS	Differential balance level	1 channels

**Parameters - continued**
**1. Output Signal - continued**

Serial port	RS232	0.18mS	0.18mS	DB9 interface	2 channels
	RS485	0.18mS	0.18mS	Phoenix terminal	2 channels
Ethernet	NTP/SNTP	10mS	10mS	RJ45 interface	2/4 channels
	PTP	0.2μS	0.2μS	RJ45 interface	2 channels

**2. Input Signal**

Name of clock source	Technical parameters	Remarks
Beidou-1	Receiver frequency :1561 MHz (B1 signal)	Built-in
	Acceptance sensitivity :-127.6 dBmW	
	Capture time :35 S < 10 S; hot start and cold start	
	Timing accuracy :≤100 ns ( unidirectional), ≤20 ns ( bidirectional)	
GPS	Receiver frequency :1575.42 MHz (L1 signal)	Built-in
	Receiving sensitivity: capture <-160 dBW, tracking <-163 dBW	
	Capture time :200 S <25 S; hot start and cold start	
	Timing accuracy :≤100 ns (1pps versus UTC time)	
	Simultaneous tracking: no less than 4 satellites in cold start; no less than 1 satellite in hot start; up to 12 satellites can be tracked at the same time, parallel 12 channels.	
IRIG-B Time Code	The IRIG-B code shall comply with the provisions of the IRIG Standard 200-04 and contain the year and time signal quality information (reference IEEE C37.118-2005), the time is standard Beijing time. Adopt IRIG-B000 format.	Built-in
	An automatic time delay compensation correction technique is used to μs the timing accuracy better than 1 μs.	
PTP input	With E2E and P2P two modes of timing.	Built-in
	Support one-step, two-steps working mode.	
Core punctuality clock module	Adopt high precision constant temperature crystal frequency precision reaches 2 E-11 order of magnitude.	Built-in
	Self-service error ≤18 us/24H.	

**3. Others**

Name of parameter	Parameters
Environmental parameters	Working temperature :-20 to +70 °C
	Storage temperature :-45 to +85 °C
	Humidity :<95%
Power supply	Power supply :220 V±20% or 110 V±20%, 47 Hz-63 Hz
	DC power supply :220 V±20% or 110 V±20%
	Power consumption ≅ 15 W
EMC grade	Grade IV specified in the GB/T 17626-2008
Alarm signal	Relay air contact (250 V,5A); Loss of satellite signals, power alarms, etc.
Appearance Weight	Standard 19" Case, height is 3 U, back pluggable structure, weight is 5 KG. Up to 8 slots are free to select various functional interface cards.