授时技术

卫星同步时钟

桌面便携版

YK-1000H卫星同步时钟产品说明书

产品简介

YK-1000H卫星同步时钟可为电力系统、自动化系统、电信系统、交通系统、安防监控等需要高精度授时要求的场景提供服务，可以接收卫星（GPS、北斗）时间信号，提供NTP授时信号，提供NTP授时服务性的时间同步服务。

Thank you for choosing our company's products! In order for you to use this product better, please read the user manual carefully before use. If you have any questions, please contact our company as soon as possible and we will provide you with satisfactory service.
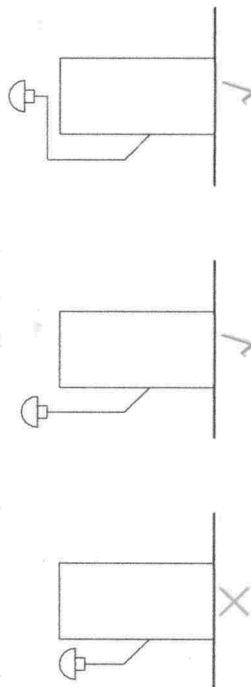
Technical Service Hotline:

Sales Service Hotline:

Address:

Catalogue

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not allowed to cut, extend, shorten or add joints.

The antenna head should be installed outdoors. In principle, when looking up along the antenna head, one can see a 360° view of the sky. The following figure shows the schematic diagrams of correct and incorrect installations.

The device should be installed as close as possible to the device that uses the clock signal. When multiple devices use the clock signal, the principle for choosing the installation position of the device should minimize the length of the cable as much as possible. To reduce the length of the antenna connection line and ensure that the received satellite signal has a certain strength, the device can be installed near the place where the antenna is led out from the building, and the output signal can be sent to the device that requires a synchronized signal through a cable.

4.3 Common Faults and Maintenance

1、Turn on the power switch of the device. If there is no display on the LCD, please check the power switch.

2、If no signal is received after waiting for more than 30 minutes upon startup, please check whether the antenna installation is reasonable and the contact is good.

3、If the LCD content display is abnormal during the operation of the device, please turn off the power switch for 20 seconds and then turn it on again.

After checking the above issues, if they still cannot be resolved, please contact after-sales service.

Revision page

Number	Chapter Name	Brief description of the revised Contents	Revision date	Before revision Version number	After revision Version number	Reviser
1		First Edition	2023.03	Ver1.0	Ver1.0	
2		Update the display interface	2025.08	Ver1.0	Ver2.0	

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4. Installation and Application

4.1 External dimensions

The YK-1000H satellite synchronous clock adopts a desktop aluminum housing. Its shape and installation dimensions are as shown in the following figure.

unit: mm

4.2 Antenna installation

The YK-1000H satellite synchronous clock is equipped with an easy-to-install antenna, which consists of an active antenna head and a guidance line. The guidance line is generally a low-loss coaxial cable about 10 meters long and can be expanded according to specific requirements when needed.

To ensure that the satellite synchronous clock can receive satellite signals, the antenna must be fixed at a location open to the sky. Fix the antenna at the top of the building. The turning radius of the antenna cable laying should not be too small. The length of the antenna cable should be strictly designed based on the antenna gain. It is

1. Overview

The YK-1000H satellite synchronous clock can provide high-precision and highly reliable time synchronization services for scenarios such as power systems, automation systems, telecommunications systems, transportation systems, and security monitoring systems that require high-precision time synchronization. It can receive satellite (GPS, Beidou) time signals and provide NTP time synchronization services.

1.1 Main features

● It adopts a multi-mode GNSS timing module [1], capable of receiving satellites from multiple systems, with rapid response and fast satellite reception.

● It adopts a power supply of 110VAC to 264VAC and 47 to 63Hz, which is suitable for different power supply scenarios.

● The accuracy is at the microsecond level, and the error between the time edge of the output second pulse and the international standard time edge is less than 0.5 μs.

● Multiple time format output modules can meet different design requirements.

● All signal output ports have undergone photoelectric isolation and have strong anti-interference ability.

● Desktop design, flexible and lightweight, not restricted by spatial environment, and convenient layout.

1.2 Interface types can be provided

● NTP Network;

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1. The timing module can be optionally equipped to receive: GPS, SBAS, Galileo, BeiDou, IMES, QZSS, and GLONASS systems

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IP: 192.168.1001.100	Current IP address Restart the update after modifying the address	PPS	Second pulse indication
Used: 9	The current number of satellites	NTP Status	Invalid- No time information is output to external devices Valid
Fix: 2D/3D	Positioning status	LCD Status	AUTO- The screen will be on for 3 minutes HOLD- The screen is always on
08:00:00 2023-06-03	Current time	Ant Status	OPEN- The antenna is not connected OK- The antenna has been connected

3.5 Rear panel configuration diagram

Antenna   Time zone selection   Network port   Power

Page -2-

2. Device structure

The YK-1000H satellite synchronization clock adopts a multimode satellite system receiving module to convert the received time of the satellite positioning system into time synchronization signals for power, communication, chemical, security and other equipment, and is equipped with NTP network output.
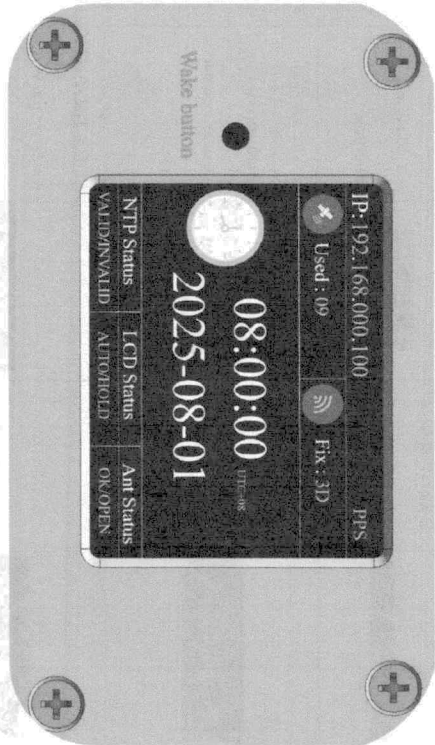
The output of the YK-1000H satellite synchronous clock has a total of 1 NTP network output.

2.1 Interface output configuration

2.1.1 NTP configuration

The usage process is as follows:

1. Power on the module and directly connect it to the computer via network cable (if the application environment requires switch access, the device and the computer should be connected to the same switch).

2. According to the actual application mode, the module configuration can be changed through the upper computer software. For the specific upper computer software configuration method, please refer to the following text.

3. The SNTP Server function can be realized after the configuration is completed.

The operation process of the upper computer software is as follows:

1. Open the configuration software, select the corresponding network card, and click "Search Module". The module list will display the modules within the subnet, as shown in Figure 1.

-2-

Page -7-

Product Manual of YK-1000H Satellite Synchronous Clock

3.4.1 Display screen Function Illustration

IP:192.168.000.100		PPS
Used: 9	Fix: 2D/3D	
08:00:00 UTC+8		
2023-06-03		
NTP Status	LCD Status	Ant Status
INVALID/VALID	AUTO/HOLD	OPEN/OK

-7-

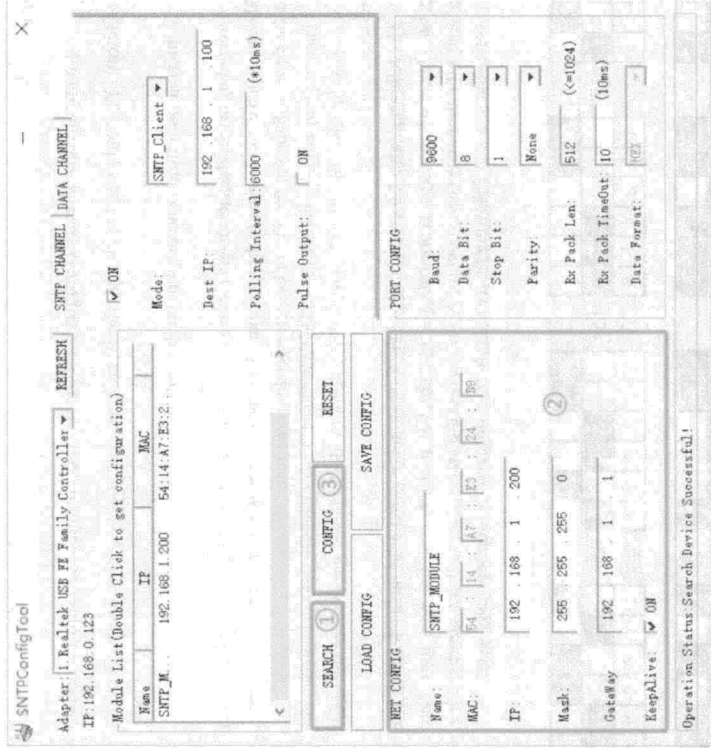

Figure 1 Search device diagram

2. Wait for the operation status to show "Device search successful!" After that, double-click the module in the module list. When the operation status shows "Configuration obtained Successfully", modify the parameters in the corresponding dialog box on the left, and then click "Configure Module Parameters".

3. After the configuration is completed, the module will restart. Once the restart is finished, click "Search for Modules" to find the module and view the configuration results.

Default network parameters of the network module	
Module name	SNTP_MODULE
Module IP	192.168.0.100
Subnet mask	255.255.255.0
Default gateway	192.168.0.1

—3—

Table 1 Parameters of the YK-1000H satellite Synchronous Clock

	Project	Technical parameters
GPS/ BeiDou	Cold start first capture time	≤2 seconds
	Time for recapture after losing the lock	≤1 second
	Automatic time positioning	1 minute
	Automatic time synchronization	1 minute
	Locate the data update rate	1Hz、2Hz、4Hz、8Hz、16Hz
	Positioning accuracy	Less than 50 meters（1σ）
	Timing accuracy	±1us
	Receiving sensitivity	-157.6dBm
Device interface		It can be flexibly configured according to actual applications
Network	Interface specification	10Base-T/100Base-TX adaptive, MDI/ MDI-X automatic polarity inversion, IEEE802.3
	Agreement	ARP、ICMP、UDP、NTP、SNTP
Isolation protection	Electromagnetic isolation	Ethernet port 1.5kV
	Surge protection	Each output line is 600W
Working power supply		110VAC to 264VAC and 47 to 63Hz
Environmental parameters		Operating temperature: -40°C to +85°C, humidity: 5% to 95% (no condensation)
		Storage temperature: -40°C to +85°C, humidity: 5% to 95% (no condensation)
MTBF		>30,000 hours

3.3 Interface transmission distance

3.3.1 Network cable

It is used for high-quality indoor transmission of NTP clock signals, with a transmission distance of ≤100m.

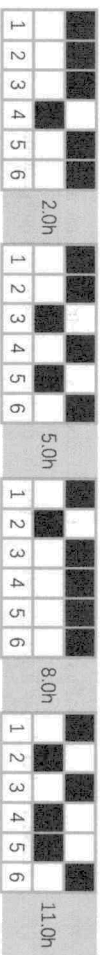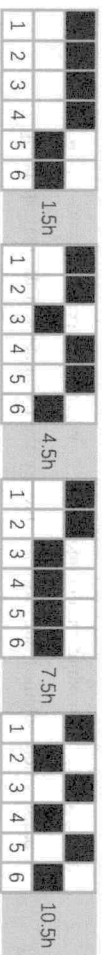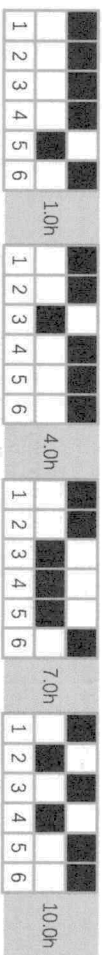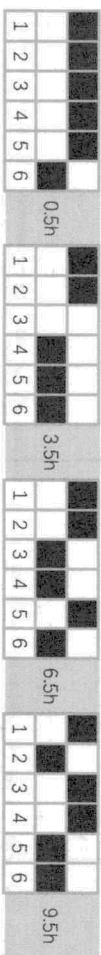### 3.4 Front panel configuration diagram

—6—

Note:

Our company has already configured all the module configuration information at the factory. You only need to change the IP address.

2.1.2 International time zone display configuration

According to the schematic diagram of the dip switch in the following figure, select the position of the dip switch corresponding to the time zone. After the selection is completed, restart the server, and the screen will display the time of the corresponding time zone.

This time only modifies the display screen time. The NTP time synchronization output remains Coordinated Universal Time (UTC), and the time zone of the device being synchronized still needs to be set.

The following table 1-6 corresponds to the 6-position dip switches at the back end of the device. The black position represents the current dip position, and the blue time zone represents the time zone corresponding to the current dip status. Among them, position 1 is ± time zone selection. The following figure only shows+ time zone, – time zone, and so on.

Dip switch time zone settings (each switch labeled 1–6):

0.5h	3.5h	6.5h	9.5h
1.0h	4.0h	7.0h	10.0h
1.5h	4.5h	7.5h	10.5h
2.0h	5.0h	8.0h	11.0h
2.5h	5.5h	8.5h	11.5h
3.0h	6.0h	9.0h	12.0h
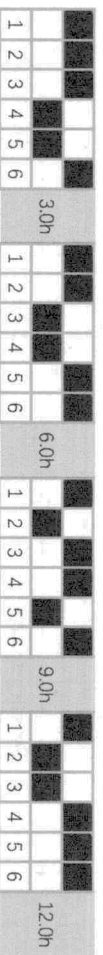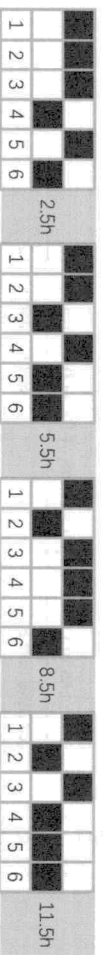
2.2 Display status configuration

2.2.1 Constant light/automatic screen-off switching

After the device is powered on, the screen defaults to automatic mode. It will turn off after 3 minutes. Press the wake-up button briefly for 1 second to wake up the screen. Press and hold the wake button for more than 5 seconds to switch the screen to constant light mode. If you want to switch back to automatic mode, press and hold the wake button for 1 second. After a power outage and restart, the automatic mode is restored.

3. Technical parameters

3.1 Basic parameters

3.1.1 Environmental conditions

Normal working atmospheric conditions:

—Ambient temperature: -40°C to +85°C

—Relative humidity: 5% to 95% (Neither condensation nor ice formation should occur inside the device)

—Atmospheric pressure: 70kPa to 106kPa

3.1.2 Electrical parameters

Working power supply: 110VAC to 264VAC and 47 to 63Hz

3.1.3 Reliability

Mean Time between Failures (MTBF) : Under normal operating conditions, it should be no less than 30,000 hours.

3.2 Performance index

3.2.1 Main technical indicators of the time synchronization device