GPS standard time synchronous clock

(GPS-2-E(IRIG-B)32-line output)

(1-line NTP/SNTP)

§1 Summarize

With the development of automatizatio technology, the request of coincide time is becoming more and more imminently for automatous system, and more and more precise for the time request. The series of GPS Standard Time Synchoronous Clock that we manufactured are specifically for power system, automatizatio system, communicate system and traffic system that need high-precise time requirer. Our system is based on GPS, and the precision of time is 1μs. The facility is secondary developed with the GPS receiver that made by the special factory of United States. It can track 12 GPS satellites at the same time, and selects the best satellite automaticly for locating and timing. It outputs 1PPS, 1PPM, 1PPH time pulse and Beijing time ,and the synchronous precision is 1μs, and it can measure the industrial frequency, and outputs date, time, cycle clock, cycle, clock difference, safe running days, and so on through RS232 serial with two formats. It is selected to used by automatization facilities that need standard time in electric power system.

The facility adopted the technology of the united of software and hardware, and made good use of the potential of GPS receiver, so it has some characters such as high security, strong function, high precision, good proportion of capability and price, operate conveniently and so on, and it can afford to the requirement of time synchronous in electric power system, automatization system, communicate system and traffic system. With its extendly used, the development of some automatization technologies such as accident analysis, trouble range measurement and relay protection and so on will be promoted and improved greatly.

§2 Technical parameter

1. Receiving frequency:1575.42MHZ, it can track 8-12 GPS satellites at the same time.

2. Antenna radio sentivity:-166dbw, with 30 metres wire. If the wire is not long enough, customer can prolong it by himself by selection of coaxial-cable that attenuation of 1.56GHZ is not more than 0.7db per metre, the attenuation of prolonged cable is not more than 5db.

3. Capture time: from 20 seconds to 2 minutes

(**Annotate:** the outputs of synchronous clock are all isolated by photoelectricity coupling and output 60ns)

4. 1PPS output:

Timing varacity: 1μs Voltage: TTL voltage

Polarity: positive pulse Pulse width: about 100ms

Impedence: 50Ω Channel number: 1

Fore edge: <20ns

5. 1PPM: output:

Timing varacity:: 1μs Voltage: TTL

Polarity: positive pulse Pulse width: about 100ms

Impedence: 50Ω Fore edge: <20ns

6. 1PPH output:

Timing varacity:: 1μs Voltage: TTL

Polarity: positive pulse Pulse width: about 100ms

Impedence: 50Ω Fore edge: <20ns

7. Cycle precision: ±0.001

8. Industry frequency clock: the clock that is promoted by industry electricity is synchronous with standard clock when power is on.

9. Clock difference: that is standard clock minus industry frequency clock,synchronous time difference is zero,precision is 20 ms.

10. Longitude, latitude: where the electric power synchronous clock locates.

11. Display: 14 bits LCD display that includes cycle,date,time,longitude,latitude,industry frequency clock,clock difference (standard clock minus industry frequency clock).

12. RS232: output time code (year, month, day, hour, minute, second), industry frequency clock time(hour, minute, second), clock difference,cycle.

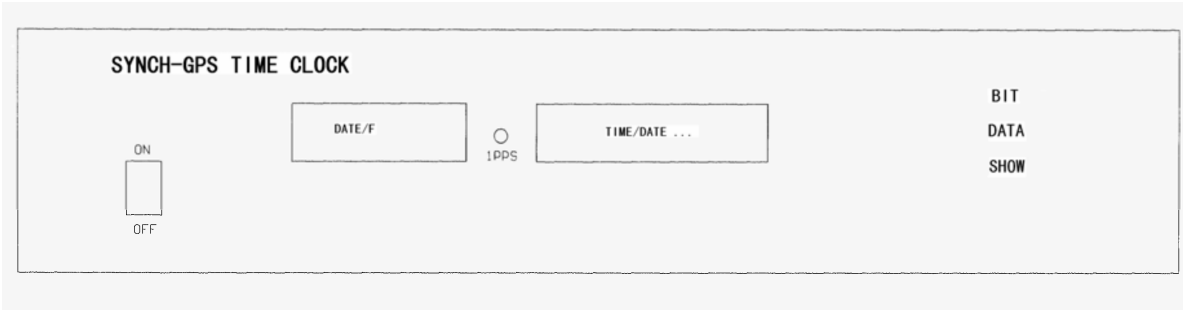
13. RS232: output "ST" format time code (selected by switching circuitry)

14. Power: DC110V, 10%, 15W.

15. Size: standard industry 19 inch 2U box.

§3 The introduction of front panel and back panel

1． The introduction of front panel that shows as picture 1:



Picture1． the front panel

⑴ **LCD screen1:** 6 bits LCD ,displays the cycle that is measured．

⑵**LCD screen2:** 8 bits LCD,display receiver's state,time,date,safe running days,longitude,latitude,industry frequency clock time,clock difference．

⑶ **1PPS indicate LED:** when the receiver tracks,the LED glints per second．

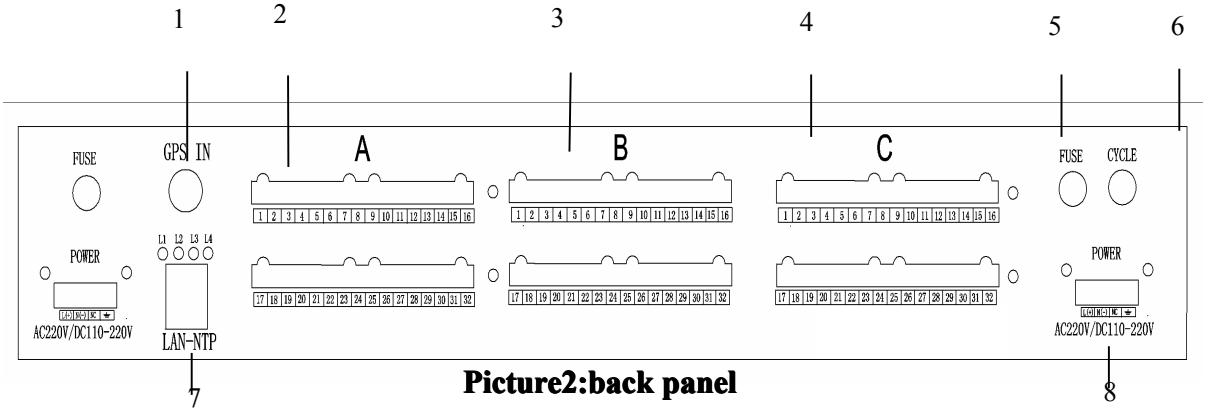
⑷ **BIT key:** set safe running days in advance． select the safe running days that is set in advance．

⑸ **DATA key:** set safe running days,change the value of every bit． the key is used as pageup key to display the content that stated in the ⑵ item．

⑹ **SHOW key:** that is used as pagedown key to display time,date,safe running days,longitude,latitude,industry frequency clock．

⑺**The power switch**．

2． The introduction of back panel that show as picture 2:



Picture2:back panel

⑴ GPS antenna input electrical outlet．

⑵ A group: 16 channels interface output includes:

2 channels-1PPS output(TTL voltage)

2 channels-1PPM output(TTL voltage)

1 channel-1PPH output(TTL voltage)

4 channels RS232 output

4 channels RS485 output

⑶ B group: 16 channels IRIG-B(DC) output(RS485 difference output)

⑷ C group: 16 channels IRIG-B(DC) output(RS485 difference output)

⑸ fuse electrical outlet(2.5A)

⑹ cycle measurement

⑺power input(110V(/DC)).

§4 using illustration

1．Using step

⑴ **How to set up antenna**

In order to receive as more satellites as possible, the antenna should be set up in the wide-field place．The wire should be prolonged when the wire is not long enough．The precision will be influenced if the illustration about how to prolong the wire in the second item were not complied with ．

⑵ **Plug the wire to the antenna electrical outlet**

Link the information such as 1PPS, 1PPM, 1PPH and RS232 serial interface signal with terminal unit through right cable, and plug DC 110V voltage to the cycle electrical outlet in the back panel(the antenna must be plugged before the power on)．

⑶ **Link the power with DC 110V**

⑷ **Switch on power**

That the two low bits of two LCD screens display HP respectively shows that the facility initializes well, and it is searching GPS satellites． the 6 bits LCD screen displays cycle after several seconds．

⑸ **1PPS indicator light glints**．

The 8 bits LCD displays figures．When the state of receiver displays “A”, it shows that the receiver works well, and the signals can be used．

2．Display

Page display uses the SHOW key (pagedown) and BIT key (pageup)．

After the receiver tracking GPS satellites, the 8 bits LCD screen displays the present time and the state of the receiver,namely.

A- HH:MM:SS

L- HOUR:MINUTE:SECOND

“A” shows that the state of receiver is right．

“L” shows that the signal lost or the received satellites are less than 4 or the other alarms,

“—“shows that the LCD is off , the same as the following situation．

After pressing the display key once,the LCD displays date, namely,

A- YY.MM.DD

YEAR.MONTH.DAY

After pressing the display key twice, the LCD displays safe running days, namely,

A- - - DDDD

After pressing the display key for three times, the LCD displays longitude, namely,

DDDMM.MMM

After pressing the display key for four times, the LCD displays latitude, namely,

DD MM.MMM

After pressing the display key for five times, the LCD displays the industry frequency clock time, namely,

A- HH:MM:SS

L- HOUR:MINUTE:SECOND

After pressing the display key for six times, the LCD displays the clock difference (standard clock minus industry frequency clock), namely,

XXXX.XX

Press the display key for more than three seconds, then let it go , then the LCD displays the standard clock again.

3. How to set up safe running days in advance and clear it.

The way to set up safe running days in advance:

(1) When the time is displayed well, press the digit key for more than three seconds, then let it go, then the LCD displays four bits safe running days .

A---DDDD.

At the same time, the figure in the leftmost glints, it shows that this figure can be adjusted. If press the figure key once ,the figure will add 1. You can adjust it until the figure that is needed arises.

(2) Press the BIT key again for more than three seconds, then let it go, then the glinting figure move to the second figure in right, then press the DATA key continuously until the right figure arises.

(3) Adjust the third and the forth figure in the same way.

(4) After adjusting the four bits safe running days right, press the BIT key for more than three seconds, then let it go then the screen display the right time information again, then the safe running days' setting up in advance is finished, and the safe running days will add 1 per day after that.

The way to clear it:

Press the BIT key and the DATA key at the same time for more than three seconds, then let them go, then the safe running days is cleared to zero.

4. Communication rule

(1) **RS-232 serial interface-BJT format**

(Outout interface RS232-1 , RS232-2 or RS485/422-1,RS485/422-2)

The definition of the two RS232 interfaces are same, RS232-2 is the interface that sends data, GND is ground.

Baud rate: 4800bit/s(set up before leaving factory)

Data bit: 8 bits(ASCII code)

Start bit: 1 bit

Stop bit: 1 bit

Parity bit: no

Working mode: asynchronous

Output year, month, day, hour, minute, second, industry frequency clock, clock difference, cycle and the information of lost error of GPS satellites. The start bit that is sent once per second is synchronous with standard second, the error is less than 0.2ms.

Output message format:

Sentence 1: BJT, YYYYMMDD, hhmmss, ±XXXX.XX, HHFFPP,

ff.f1f1f1<CR><LF>

BJT is time code head;

YYYY is year, MM is month, DD is day;

hh is hour, mm is minute, ss is second;

± is the sign of clock difference, XXXX.XX is clock difference (standard clock minus industry frequency clock), the unit is second.

HH FF PP is hour, minute, and second of industry frequency clock respectively.

ff are the two integer fractions of cycle,f1f1f1 are the three decimal fractions of it.

Sentence 2:ERR,YYMMDD,hhmmss,<CR><LF>

(It will output sentence 2 when the received satellites are less than three)

Annotate: the output information format can be changed according to customer's requirement.

⑵ **RS-232 serial interface-B format(selection)**

(Output interface RS232-3,RS232-4 or RS485/422-3,RS485/422-4)

The definitions of the two interfaces are same, RS232-2 is the interface that sends data, GND is ground.

Communication rule:

Interface standard: RS232 or RS422/RS485

Communication speed: 4800b/s

Data bit: 8 bits(the data is compress BCD code, the character is ASCII code)

Start bit: 1 bit

Stop bit: 1 bit

Parity bit: no

Output message format:

<B>HHMMSSYYM_1M_1DD<F>FFF$_1F_1F_2F_2$<C>$H_2H_2M_2M_2S_2S_2$<CR>

<B> is the start character，<F> is the industry frequency sign，<C> is the cycle sign, <CR> is the end sign，they are all ASC Ⅱ code.

HHMMSSYYM_1M_1DD is hour, minute, second, year, month, day of Beijing time respectively;

FF is the integer fraction of cycle;

F_1F_1 is the first bit and the second bit respectively that behind the cycle's radix point.

F_2F_2 is the third bit and the forth bit respectively that behind the cycle's radix point.

$H_2H_2M_2M_2S_2S_2$ is hour, minute, second of cycle clock respectively;

All the figures above are compress BCD code.

The series of information are sent once per second, the ascending edge of start bit is synchronous with that of standard second.

⑶**RS-232 serial interface-ST format(output can be selected by switching circuitry)**

(Output interface RS232-3,RS232-4 or RS485/422-3,RS485/422-4)

The definitions of the two interfaces are same, RS232-2 is the interface that sends data,GND is ground.

Communication rule:

Baud rate: 4800b/s(set up before leaving factory)

Data bit: 8 bits(character is ASCII code)

Start bit: 1 bit

Stop bit: 1 bit

Parity bit: no

Working mode: asynchronous

Format: SThhmmssDDMMYYAFhhmmssff .

fffB<CR><LF> **Illustration:**

<ST>is the start character，<AF>is the industry frequency sign，<CR>is the end sign，they are all ASC Ⅱ code.

hhmmssDDMMYY is hour, minute, second, day, month, year of Beijing time respectively;

AF is the industry frequency sign.

hhmmss is hour, minute, second of cycle clock respectively.

ff.fff is cycle.

B is the end sign.

The series of information are sent once per second, the ascending edge of start bit is synchronous with that of standard second.

⑷ **the output format of display in long-distance . (SW-1 is on)**

(Output interface RS232-3,RS232-4 or RS485/422-3,RS485/422-4)

That the output format of display in long-distance is used to display date, time, cycle, safe running days clock difference and industry frequency clock in different place.

Communication rule:

Interface standard: RS232 or RS422/RS485

Communication speed: 2400bit/s

Data bit: 8 bits(the hex that is expressed by two-bit binary system)

Start bit : 1 bit

Stop bit : 1 bit

Parity bit: 1 bit (odd)

Working mode: asynchronous

Output year, month, day, hour, minute, second, safe running days, cycle, industry frequency clock and clock difference and so on to display in long-distance . output once per second.

Format:

Sentence1:EBH 90H EBH 90H 11H <ZZ> <hh> <mm> <ss> <LPC> 0DH 0AH

There are 12 bytes altogether, the same as the following.

EBH 90H is ID, 11H is the address code of display that displays time, <ZZ> is state character. <hh> is hour , <mm> is minute, <ss> is second, <LPC> is longitudinal checkout, all the bytes are xor and reversed(not include LPC itself). 0DH 0AH is <CR> <LF>'s ASCII code respectively.

Sentence 2: EBH 90H EBH 90H 12H <ZZ> 00H <an1> <an2> <LPC> 0DH 0AH

EBH 90H <ZZ> <LPC> 0DH 0AH are same as sentence 1 ,12H is address code of display that displays safe running days.

<an1> is the thousand and the hundred of the safe running days.

<an2> is the decimal and the figure of the safe running days.

Sentence 3: EBH 90H EBH 90H 13H <ZZ> 00H <ff1> <ff2> <LPC> 0DH 0AH

EBH 90H <ZZ> <LPC> 0DH 0AH are same as sentence 1, 13H is address code of display that displays cycle.

<ff1> is the decimal and the figure of measured value of cycle.

<ff2>is the two decimals behind the radix point of measured value of cycle, the unit is HZ.

Sentence 4: EBH 90H EBH 90H 14H <ZZ> <HH> <MM> <SS> <LPC> 0DH 0AH

EBH 90H <ZZ> <LPC> 0DH 0AH are same as sentence 1. 14H is address code of display that displays industry frequency clock.

<HH> <MM> <SS>is hour, minute, second of industry frequency clock respectively.

Sentence 5: EBH 90H EBH 90H 15H <ZZ> <S2> <S1> <S0> <LPC> 0DH 0AH

EBH 90H <ZZ> <LPC> 0DH 0AH are same as sentence 1. 15H is address code of display that displays clock difference.

<S2> is the millesimal and the centesimal of clock difference.

<S1> is the decimal and the figure of it.

<S0> is the two decimals behind the radix point of clock difference.

The unit is second.

Sentence 6: EBH 90H EBH 90H 16H <ZZ> <YY> <MM> <DD> <LPC> 0DH 0AH

EBH 90H EBH 90H are the same as above, 16H is address code of display that displays date. <ZZ> is state character; <YY> is year; <MM> is month; <DD> is day, the others are same as above.

The definition of bit of state character <ZZ>

D7 bit: 1 negitive, 0 positive.

D6 bit: 1 die, 0 right

D5 bit: 1 half light, 0 light

D3 D2 bit: 01 the radix point is between the figure and the decimal.

10 the radix point is between the decimal and the hundred.

11 the radix point is between the hundred and the thousand.

D1 D0 bit: 01 the upper limit. Glints fastly (when frequency exceeds 50. 2HZ, alarm)

10 the lower limit. Glints fastly(when frequency under 49. 8HZ , alarm)

(5) IRIG-B(Inter Range Instrumentation Group)

① IRIG code, with obvious character of analog technology, is derived from recording time information for tape, and it has been widely used as time-transfer standard since 1950s.

IRIG-A and IRIG-B were all researched in 1956, they have the same theories but not the same carrier frequency, so the resolving power are different. IRIG-B contents such informations as day, hour, minute, second and controlling information and so on. The widest width of channel that it occupies is 3KHz, so it can be transmitted inside a building through common twisted-pair, and it also can be transmitted in long distance through analog phone wire.

By 1990s, in order to meet the requirement that the year's expression in turns of century, IEEE 1344-1995 prescribe the new format of IRIG-B that include year information, and the other aspects are not change.

② DCLS(DC Level Shift)

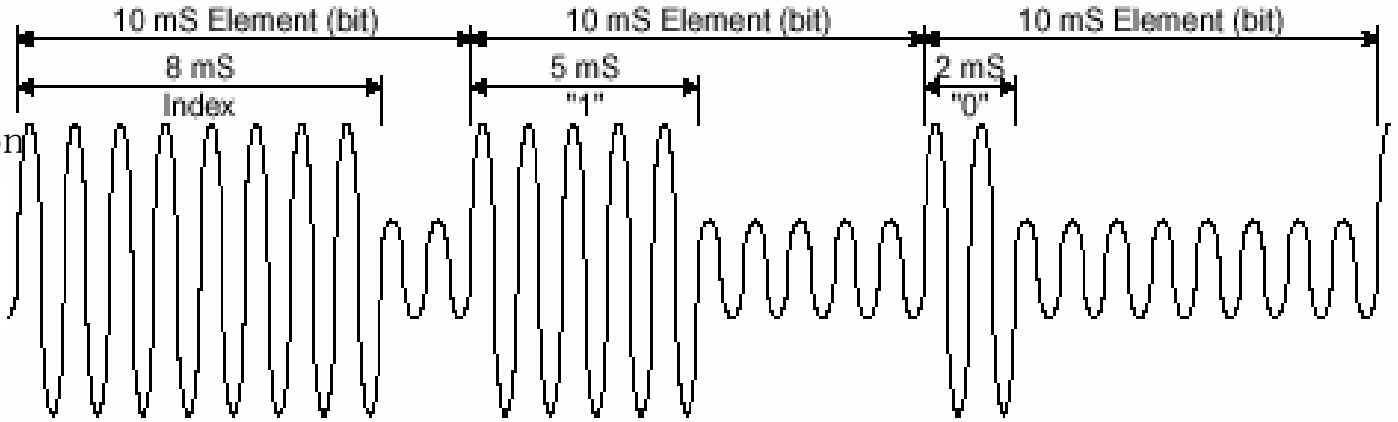
DCLS is another transmitted code of IRIG code that brings code unit information by DC voltage, equal to the outboard of IRIG modulated code.

IRIG-DCLS technology is the same with transmitting inside the field through twist-wire.

That the comparison of IRIG-B common way and IRIG DCLS format is illustrated in the picture. When information is transmitted among the customers by using of the technology, the fixed time prolonging that is intervented by intellectual compensation transmitted system is required.

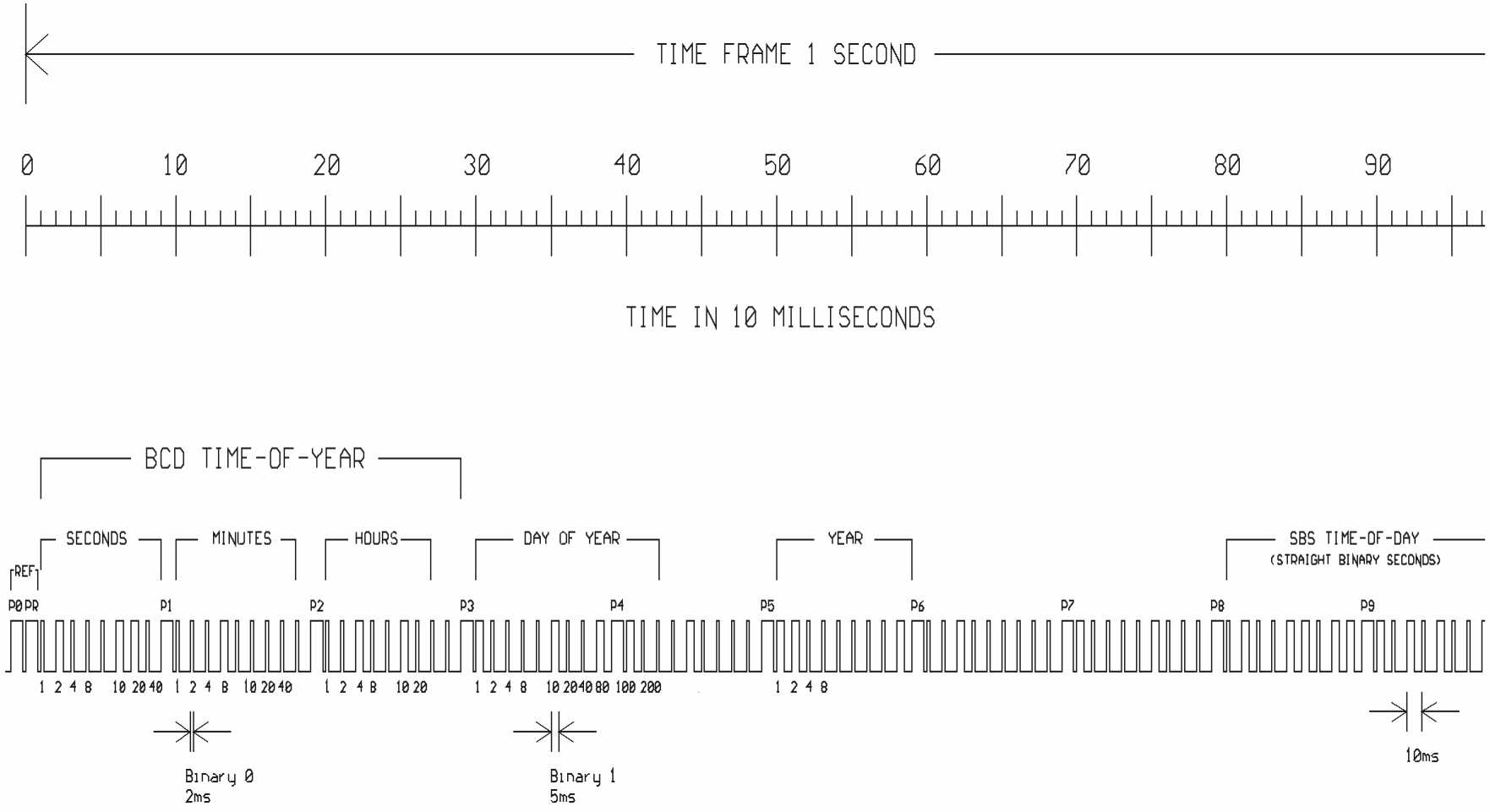
③ information illustration

Typical modulation



IRIG B

DC LS



Picture 1 The comparition picture of IRIG B and DCLS

5．Output interface illustration

5.1 Illustration of function of interface:

Serial interface output		32 channels IRIG-B（DC）output（RS485 format）			
Interface number	function	Interface number	function	Interface number	function
A1	1PPM output	B1	1-	C1	17-
A2	GND	B2	1+	C2	17+
A3	1PPM output	B3	2-	C3	18-
A4	GND	B4	2+	C4	18+
A5	1PPH output	B5	3-	C5	19-
A6	GND	B6	3+	C6	19+
A7	RS232-11 output	B7	4-	C7	20-
A8	GND	B8	4+	C8	20+
A9	RS232-12 output	B9	5-	C9	21-
A10	GND	B10	5+	C10	21+
A11	RS232-21 output	B11	6-	C11	22-
A12	GND	B12	6+	C12	22+
A13	RS232-22 output	B13	7-	C13	23-
A14	GND	B14	7+	C14	23+
A15	D	B15	8-	C15	24-
A16	GND	B16	8+	C16	24+
A17	D	B17	9-	C17	25-
A18	1PPS output	B18	9+	C18	25+
A19	GND	B19	10-	C19	26-
A20	D	B20	10+	C20	26+
A21	GND	B21	11-	C21	27-
A22	D	B22	11+	C22	27+
A23	485-11+	B23	12-	C23	28-
A24	485-11-	B24	12+	C24	28+
A25	485-12+	B25	13-	C25	29-
A26	485-12-	B26	13+	C26	29+
A27	485-21+	B27	14-	C27	30-
A28	485-21-	B28	14+	C28	30+
A29	485-22+	B29	15-	C29	31-
A30	485-22-	B30	15+	C30	31+
A31		B31	16-	C31	32-
A32	GND	B32	16+	C32	32+
	D		—		—

5.2 Illustration of use of interface:

(1) **A group:**

1PPS, 1PPM, 1PPH output are TTL voltage.

RS232-11 and RS232-12 output rules are same(format 1 is set up before leaving factory)

RS232-21 and RS232-22 output rules are same(format 2 or format 3 is set up before leaving factory)

RS485-11 and RS485-12 output rules are same(format 1 is set up before leaving factory)

RS485-21 and RS485-22 output rules are same(format 2 or format 3 is set up before leaving factory)

(2) **B group and C group:**

32 channels IRIG-B(DC) output (RS485 difference output).

Illustration:IRIG-B(DC) adopts RS485 difference output, the facility is not link the matching resistence, it is suggested that a 120Ω resistence should be linked to the user terminal.

Network Time Server
(SYNCH-NTP)

§1 Summarize

SYNCH-NTP network time server is a small, independent server which based on the NTP/SNTP Time Protocol, SYNCH-NTP obtain the standard time signal information from GPS ,when the information transports in the network, the equipment what need standard time signal such as computers, controllers and other devices can be synchronized with the standard time signal. Standard time signal transports by TCP/IP Protocol, SYNCH-NTP support many popular Time Protocol ,such as NTP, time/UDP, and time broadcast data packet what delimit by ZHONG XIN CHUANG KE. The port number of NTP and time/UDP assign is designated 123 and 37 by RFC-123 and RFC-37.

SYNCH-NTP is very simple to use, connect the export of Satellite receiver antenna to the BNC port of SYNCH-NTP, and connect the Network I of SYNCH-NTP to the HUB, then the network can get standard time signal.

SYNCH-NTP include GPS receivers, to receive more satellites, the antenna should be set up in the wide-field place, the best place is roof; to receive more satellites, please far from the wall if you set up on the wall.

The length of antenna is 30M,and it can change if you need.

SYNCH-NTP take 19-inch standard chassis,2U/1U high degree, 220V AC power (or-48V).

§2 SETTING

SYNCH-NTP can set the IP address and working methods by remote login Ethernet port.

Waring:

SYNCH-NTP should get the only IP address before use.

1、Default IP address

The ip address of SYNCH-NTP is 0.0.0.0,it meanings SYNCH-NTP can automatically get ip address from DHCP.

When the network include DHCP server,the SYNCH-NTP gets ip address ,subnet mask and gateway address automatically from the DHCP server.Other,SYNCH-NTP get ip address automatically,and show error warings by LED.

Waring:If SYNCH-NTP is setted ip address, SYNCH-NTP will not broadcasting DHCP request when starting.

2、Set IP address

SYNCH-NTP can be setted ip address by Ethernet port.

（1）In the UNIX host or DOS of WINDOWS system,key the following command:

arp -s 192.168.0.123 00-03-B9-XX-XX-XX

00-03-B9-XX-XX-XX is the MAC address of DN.(Every SYNCH-NTP is writing the MAC address label in the obvious place)

The ip address of SYNCH-NTP is setted to 192.168.0.123.

Waring:the command produces the results when Windows system has other MAC address except oneself in the ARP table, otherwise it will give the error message.Then,as long as ping any computer in the network. May use arp - a to examine the ARP table.

（2）Keying telnet 192.168.0.123 1,it will give the error message very quickly,needn't pay attention to these informations.

（3）Keying telnet 192.168.0.123 9999,9999 prot number serial prot is the serial port server which using in the long-distance management specially the TCP port, then enters the establishment contact surface.

Waring:only setting and saving ip address from 9999 prot number,otherwise the ip address is temporary, after SYNCH-NTP power failure, this temporary IP address will expire.

3、Parameter Establishment

After SYNCH-NTP had already established the IP address, input "the telnet 192.168.0.123" in the windows's menu 9999 of run to carry on the long-distance establishment.

After telnet,may see the following information and the menu:

*** NTS ***

Serial Number 7453876 MAC address 00:03:B9:74:D2:74

Software version 04.4 (010817)

Press Enter to go into Setup Mode

*** basic parameters

Hardware: Ethernet Autodetect

IP addr 192.168.0.32, no gateway set

*** NTS parameters

Antenna type: NMEA 0183

SNMP manager IP addr: 192.168.000.002

SNTP Ref.Identifier: "GPS"

Encryption is disabled

Sending UDP datagram to Port 2711(hex) every 001 minutes

Send UDP datagram to: <broadcast>

Change Setup :

0 Basic configuration

1 NTS configuration

7 Factory defaults

8 Exit without save

9 Save and exit

Your choice ?

4、Set IP Address

Chooses 0 :sets the SYNCH-NTP server's parameter, like the IP address, the subnet mask and the gateway address, pays attention to the IP address in the local area network to be only, the subnet mask is the figure of bit0.

5、Password

Provides the password protection for 9999 prot, this password is longest 4, it will give the input password the prompt before telnet when has.

6、NTS Configuration

Chooses 1 :sets NTS Configuration

(1) SNMP manager IP addr Set SNMP server's IP address, sets the IP address after keying Y. (may set 2 SNMP server's IP address).

(2) Syslog IP addr Monitors the SYNCH-NTP work status with the UNIX system. The following four conditions may by the record:

- NTS startup
- NTS sync'ed
- NTS unsynch'ed
- NTS sign. lost

A SYSLOG record example:

"Apr 12 16:10:27 sb244 V:04.4b5 (010412) / S/N:1200354 / MAC:00:03:B9:12:01:62 / MSG:NTS startup"

The preserved information's filename may assign is LOCAL0 - LOCAL7.

(3) Enable encryption permission data encryption verification, Y- permitn, N- don't permit.

(4) Change SNTP Ref.Identifier "GPS" Changes the SNTP symbol.

(5) Enter UDP Port (hex 2711) UDP port number of time data packet which ZHONG XIN CHUANG KE defined, does not permit the transmission when establishment is 0.

(6) Send Block every n minutes Every other n minute transmits the front time data packet.

(7) Send UDP broadcast permits the above data packet broadcast, Y- permitn, N- don't permit.

(8) Enter up to eight target addresses for UDP block Enter up to eight target addresses for UDP block, finished the input when 0.0.0.0.

7、Factory defaults

Chooses 1 : all parameters will factory defaults, but the IP address, the subnet mask and the gateway maintains invariable.

8、Exit without save

The front revision will be invalid.

9、Save and exit

Save the front revision and exit SYNCH-NTP.

§3 Time Data Packet Form

1、NTP

SYNCH-NTP work in the Server condition. Supports NTP1.0, NTP2.0, NTP3.0, and the encryption compares the proven prescription type of DES and MD5, if does not use the encryption to compare the proven prescription type, SYNCH-NTP may satisfy thousands of computer's time server requests.

2、Time/UDP

Uses in the old UNIX system and some special-purpose PC software.

3、ZHONG XIN CHUANG KE's time data packet

Altogether 32 bytes, the data in each minute (this option may change) start when the first second sends out, concrete showing is as follows

Deviation	Explanation
00...01	Year (00...99)
02...03	Month (01...12)
04...05	Day (01...31)
06...07	Hour (00...23)
08...09	Minute (00...59)
10...11	Seconds (always 00)
12	day of week (1-Mo, 2-Tue, ...)
13	DST enabled (0-no, 1-yes)
14	String termination, '\0'
15	Reserved (always 00)
16...19	CET/CST Time on UNIX Format 32bit value, network byte order seconds since 1/1/1970
20...23	GMT Time on UNIX Format 32bit value, network byte order seconds since 1/1/1970
24...31	Reserved (always 00)

§4 Connection and LED Instruction

Back

●---L1

●---L2

●---L3

●---L4

LED	instruction	function
L1	establishment，red	Twinkle meaning Telnet connection
L2	Ethernet Link ，yellow	bright meaning ethernet connection is normal
L3	network time available ，red	bright expression already and GPS time synchronism;twinkle expresses in the time synchronization process， unable provide the time service for the network;extinguishment indicated that
L4	Satellite loss，green	Coordinates with L1 to demonstrate DN the breakdown reason red bright, green twinkle 1 time: EPROM verification and wrong 2 times: RAM is not normal 3 times: Network controller not normal 4 times: EEPROM makes a mistake 5 times: IP address conflict 6 times: The software release is inappropriate Red twinkle,green bright 4 times: The ethernet has not connected 5 times: Has not received DHCP the response red twinkle, green extinguishment Does not have any effective time source, including GPS and built-in clock red extinguishment, green twinkle time synchronism

Ethernet RJ45 definition:

point	signal	direction
S1	TXD+	output
S2	TXD-	output
S3	RXD+	input
S4	-	—
S5	-	—
S6	RXD-	input
S7	—	—
S8	—	—

Appendix1

The subnet mask table:

The subnet mask	The setting of Serial port server
255.255.255.252	2
255.255.255.248	3
255.255.255.240	4
255.255.255.224	5
255.255.255.192	6
255.255.255.128	7
255.255.255.0	8
255.255.254.0	9
255.255.252.0	10
255.255.248.0	11
. .	
. .	
255.128.0.0 23	23
255.0.0.0	24

Appendix2

The picture of size of 2U box(unit:mm)