# Software Operation Manual for PTS-DR200L Card-Mounted Economical Clock

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## Preface

This manual mainly introduces the access mode and software characteristics of PTS-DR200L Card-Mounted Economical Clock product, and introduces the configuration and use method of this product in detail through Web interface.

## **Content organization**

This manual is mainly introduced from the following contents:

Module	Characteristic description
1. Product introduction	<ul> <li>Overview</li> <li>Software characteristics</li> </ul>
2. Device access mode	> Web access
	Telnet access
	➢ SSH Access
	Debug serial access
3. Network	➢ Interface
	> Static routing
4. Application	> Mail alarm setting
	MAC Address Filter Settings
	<ul> <li>Alarm (basic alarm, power failure alarm)</li> </ul>
5. Clock Server	<ul> <li>Synchronization source parameters</li> </ul>
	Clock parameter
	> NTP Parameters
	> PTP Parameters
	> Output parameter
	SNMP management
	Synchronization source state
	Clock state
6. Users	User management
	Change password
7. Systems	> Log
	> Backup/Restore

	> Upgrade
	> System reset
	> Restart
8.OLED display screen	> Interface structure
	<ul> <li>Reference time information interface</li> </ul>
	<ul> <li>Firmware Compilation Time Information Interface</li> </ul>
	<ul> <li>Software version information interface</li> </ul>
	<ul> <li>Hardware version information interface</li> </ul>
	<ul> <li>Synchronization source and clock status information interface</li> </ul>

#### This manual stipulates that

## 1. Text format convention

Format	Description
<>	The content in "<>" represents the button name, such as "Click < Apply > button".
[]	The contents in "[]" indicate the window name and menu name, such as clicking the "[file]" menu item.
{}	The content in "{}" represents a combination, such as "{IP address, MAC address}" means that IP address and MAC address are a combination, and can Configure and display together.
$\rightarrow$	Multi-level menus are separated by " $\rightarrow$ ", for example, "Start $\rightarrow$ Program $\rightarrow$ Attachment" indicates the [Attachment] menu item under the [Program] submenu under the [Start] menu.
/	Choose one of two or more and separate it with "/", such as "addition/subtraction" for addition or subtraction.
~	Represents a range, such as " $1 \sim 255$ " representing a range from 1 to 255.

## 2. Command-line format conventions

Format	Description
Bold font	Command-line keywords that display the software version of the switch as typed in the CLI configuration, such as "show version".
Italic	Command line arguments, parts that must be replaced by actual values, such as "show VLAN id" showing the VLAN number as VLAN VLAN information for the id.

## 3. Mark protocol

Sign	Description
	Remind the matters needing attention in operation and configuration, and supplement the description of operation content.
Attention	
1	Make necessary explanations for the operation contents.
Description	



Special attention should be paid to incorrect operation, which may lead to data loss or device damage.

Product supporting materials

The supporting materials of PTS-DR200L Card-Mounted Economical Clock include the following contents:

Data name				Content introduction
PTS-DR200L	Card-Mounted	Economical	Clock	Learn more about board structure and hardware specifications
Hardware Insta	ller			
PTS-DR200L	Card-Mounted	Economical	Clock	Understand the functions of device software and master the
Software Instal	ler			Web configuration method of each functional module and
				Configuration steps

## **1** Product Introduction

#### **1.1** Overview

PTS-DR200L is a Card-mounted multifunctional clock server that provides nanosecond time service for industrial fields. It supports automatic tracking and locking of BDS, GPS and GLONASS satellite absolute time reference and IEEE1588 and IRIG-B ground-based time reference. Through a safe and reliable time source selection mechanism, PTS-DR200L can automatically select the correct external time source for time synchronization. By comparing the time difference between local clock and external time source one by one and analyzing the signal quality and stability of each time source in detail, It can choose a reliable time source as its own reference time. It supports a variety of time output signals including IEEE1588, NTP, IRIG-B, 1PPS, 1PPM, 1PPH, and TOD, which meet the requirements for device configuration management through web functions. It also supports management modes such as SNMP.



Figure 1 Time Synchronization Erection Diagram

## **1.2** Software Characteristics

This series of device has rich software features, which can meet different needs of customers.

Interface function: electrical port 10/100 m/1000M adaptive, optical port 100M, support port isolation clock characteristics: support space-based synchronous source satellite source GPS/BDS/GLONASS

Support ground-based synchronous source IRIG-B (fiber input) & IEEE1588 (network port input)

Support setting time source priority, mode, etc.

Support setting clock time zone, summer time, clock output mode, etc.

5

Support for NTP v1/v2/v3/v4 & SNTP Support for MD5 Authentication (Network Port Output)

Support for PTP (E2E and P2P) and P2P (Network Port Output)

Support for IRIG-B (BNC interface Output)

Supports 1PPS, 1PPM, 1PPH and TOD (serial interface output)

Support status information view includes synchronization source status & clock status support

LED screen display satellite signal status time information and so on

Routing: Support static routing

Security features: Support SSH, MAC address binding, user classification, AES\ DES\ 3DES data

#### encryption.

Device management: Support Console/Telnet/Web management (HTTP/HTTPS)

Support KyCMT integrated debug management tools (device search, IP address configuration,

etc.) support ICMP control messages

Support SNMP v1/v2c

Support for SNMP Trap

Support ARP, DNS, DHCP Client

Device maintenance: support to upgrade through WEB software

Supports FTP, TFTP, Syslog

Support SMTP mail alerts

Support MAC address whitelist enable LED screen display

•••

## **2** How To Access The Device

Support several ways to access devices:

- Web browser access
- ➤ Telnet access
- ➢ SSH Access
- Debug serial access

#### 2.1 Web Access

Web login requires proper communication between the PC and the device network.



1. Enter "IP Address" in the address bar of the browser, and the login dialog box appears as shown in Figure 2. Enter the default user name "admin" and password "pwd\$4\$Kyland", or enter other created user names and passwords, and click the < Login > button;

KYLAND	PTS-DR200L-1111-HV		
		Authoritation Required	
		Second Control of Cont	
		(LORM) (MEMP)	

Figure 2 Web Login

Enter the main interface, and switch to English or Chinese Web operation interface in the upper right corner. The factory configuration defaults to browser language.

2. At this time, successfully log in to the device page, and the configuration navigation tree is on the left, as shown in Figure 3;

a non	Provide the second s	GL3
Concession in the local division of the loca	Sheh Note	
All and a second second	Ann L	
1100	Ind Series Philippentities 1	
	Ped Name PE DUBLITTERY	
	Theory Testing and Constrained	
	The second secon	
	KYLARO	
	Engineering (1) (000-000 to trained fractioning) Lemma	

#### Figure 3 Web interface

The home interface is used to display device information, including: serial number, host name, software version, hardware version and device time. Serial number, host name and hardware version are set when they leave the factory, and will not change later; The page shows that the software version and time change with the actual situation.

Click the menu in the navigation tree to expand/close the menu item. Click  $\pm \mathbf{x}$  to link to the Web shown in Figure 3 the first interface, that is, clicking the icon under any circumstances can switch to the first interface of the Web; Click  $\mathbf{x}$  on the language display bar to switch the system language; Click to exit the Web operation interface; Click to enter Kyland Technology official website.

### 2.2 Other Access Methods

Web access can satisfy the normal use of the device. telnet, SSH, debugging serial port and other access methods are used to troubleshoot problems, limited to use under the guidance of technical support, and are not open to the outside world. If there is any need, please contact our technical support.



## **3** Network

#### **3.1** Interface

#### 3.1.1 Interface Information Display

The Network-Interface page is used to display the relevant network parameters of the serial server device, including device running time, MAC address, received/sent data volume, IP address, etc., as shown in Figure 4.

Notwork .	D Patto mono ++ Nationali ++ Interface Interface		
Datic Route	1022		Alter
Application Clock Server User	دهم شودار جو	Applicate) Courte 3 Hearing 9 Minuteda 3 Secondiza MAC Address On Neural Minute 1 KK 1028 KG (add 1964) TK 6207 K 6208 KB (Minu) SP44 F12 566 H11	-
pateres .	لاهم الله الله الله الله الله الله الله	Uptiment Despite Directed & Ministerie B Secondus MAR Address (Colonalation 1997) (Colonalation) (Colonalation) (Colonalation) (Colonalation) (Colonalation)	
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	6001 4001	Vytime II Gaylo 3 Hourse 3 Minutesia 3 Secondas MAC Address On Investidation 14 800 3 E O Hou This 212 HD (22 Press 1944-112 100,111)	
	2021 40	Optiment Daryst O Hourist O Minuteski I Sectoralist MAR Additives:000 Seculation 11 000 Sectoral Tot 2.55 KM (24 Press Daryst 2014 Sector 111)	-

Figure 4 Network Interface Information

The running time of the device is timed from the start of the network card, and if the device is restarted, the data is recalculated; The MAC address is set when the device leaves the factory, and the MAC address is unique; The receiving/sending quantity is the receiving/sending data calculated after the device network card is started. IPv4 address represents the IP of the network card, and the correct IP address can communicate with other devices in the network.

#### **3.1.2** Ip Address Configuration

1. After clicking the Network  $\rightarrow$  Interface menu, the < Edit > button appears on the Network Interface page. Click the < Edit > button to enter the network interface editing interface. Users can set the IP address, subnet mask, gateway, custom DNS and multi-IP address of the network port-LAN (ge0) ~ LAN4 (sfp1). When all parameters are set, click < Apply >, and the network function will automatically restart and take effect.

#### Protocol

Configuration option: Static address/DHCP

Default configuration: Static address

Function: Select Static address, you need to manually configure IP address and subnet mask; When DHCP is enabled, the device automatically obtains the IP address through the DHCP protocol as a DHCP client. At this time, there should be a DHCP Server in the network as a client End assigns IP address and subnet mask.

#### **IPv4 Address**

Configuration format: x. y. z. w, address must be a valid IP address separated by dots ('x. y. z. w').

1) x, y, z, and w are decimal numbers between 0 and 255

2)x cannot be 0

3)x cannot be 127

4)x cannot be greater than 223

5)w cannot be 0 or 255.

Function: IP address of LAN interface.

#### **IPv4 Subnet Mask**

Configuration format: x. y. z. w, address must be a valid IP address separated by dots ('x. y. z. w'); The input subnet mask must be a continuous "1" to convert to binary before it can be verified as a legal subnet mask.

And it can be represented as 26, that is, in a 32-bit subnet mask, the first 26 bits are consecutive "1s". When the subnet mask input is not a continuous "1", it will check that the prompt is in an illegal format, such as 255.255. 250.0, and the binary display is 111111111111111111111111010.00000000.

Function: Identifies that the server belongs to a class A, B or C network.

#### **IPv4** Gateway

Configuration format: x. y. z. w, the rules are the same as above

Function: It is a computer network how to forward packets to other nodes in the network, in the absence of a specific route, clear out the next hop IP address of sending packets.

#### Use a custom DNS server

configuration format: x. y. z. w, with the same rules as above

Functions: DNS, Domain Name Server is a domain name and its corresponding IP address

KYLAID

translation server. DNS stores a table of domain names and their corresponding IP addresses to resolve the domain names of messages.

2. Configure multiple IP addresses. You can manually configure the secondary IP address of the device IP interface, as shown in Figure 5.

	El Path: Home >> Network >>	Interface -> Interface S	rtings	
Atternation in the second s	Interface Settings			
nterface				
tatic Route	Interfaces -lan	1		
Application	Network changes will applied t	o applications altar a da	ing reheats	
Church Sterner	there are proved by the spectral	a selection and a se		
1 Mar	Interface sume	lant		
Construction of Construction of Construction	Tratucal	Static address		
Strain.	Ped abless	192 168 1 111		
	Did seture is	244 246 268 0		
	and a second			
	- invest gartenessy			
	Use custom DNS servers		- Sterner	
		192 168 1 112	(m)	
		192.168.1.113	8	
		192.168.1.114	(A)	
	and a second	192.168.1.115		
	Molt: Predition	192.168.1.116		
		192.168.1.117		
		192 168 1.118		
		192,168,1,519		

Figure 5 Configuring secondary IP

Configure multiple IP addresses, click Add>button to add up to 8; Click <a><br/>Delete>button to delete, and click</a> on the page, and the device restart will take effect.

#### **Multiple IP addresses**

Configuration format: x. y. z. w, the rules are the same as above, and the main IP needs to be in the same network segment.

Function: Manual configuration of multiple IP addresses.



#### Note:

- Each IP interface corresponds to one primary IP address and can correspond to multiple secondary IP addresses;
- Different IP interfaces should be configured with different network segments for primary/secondary IP addresses, otherwise, it will cause the router to be unsure of which exit to choose.

#### **3.2** Static routing

#### 3.2.1 Introduction

The static routing function is divided into two parts: static routing and routing status. Static routing configuration includes destination network, subnet mask, gateway, and the interface can be selected as specified network interface or default, with a maximum of 10 static routes configured. The static routing function configuration is shown in the following figure:

KYLAND					
	Path: Home >> Network >>	Static Route			
Network	Static Route Route Info				
Interface					
Static Route	and the second se	Consideration of the local distance of the l	Contracting of the local division of the loc	and the second	a boost of
+Application	Destruction	SUDNEY MILL	Garrey	and the second s	Operation
+Clock Server	192.168.5.0	255 255 255 0	192.168.0.3	None 🗸	12 2
+User					
	Acob				

Figure 6 Example of Static Routing Configuration

The routing status function is used to view the existing routes of the device. The routing status is shown in the following figure:

	El Path: Home >> Network >> Static Roy	te		
Network	Static Route Route Info			
Interface				
Static Route	Dest Network	Soloret Mark	Colleway	
Application	192.168.0.0	24		ge0
Clock Server	192 168 1.0	34		ath1
-User	126.196.106			
System	192.168.2.0	24		eth2
	192.168.3.0	24		eth3.
	192.168.4.0	24		eth4
	192.168.5.0	24	192.168.0.3	ge0

Figure 7 Routing Status Page

#### 3.2.2 Web page configuration

The static routing function configuration interface is shown in the following figure:

KYLAND					
	D Path: Home >> Network >> S	tatic Route			
-Network	Static Route Route Info				
Interface					
* Static Route	Dest Network	Subset Market	Contractory of Contractory	Sales and Sales	Orenation
+Application	-		Concept 1		operation
+Clock Server				None 🗸	1
+User					
+System	Apply				

Figure 8 Static Routing Configuration Page

#### **Destination network**

Configuration options: The configuration format is the same as the IPv4 address rules in section

3.1.2.

Function: IP address where data arrives

#### IPv4 subnet mask

Configuration options: The configuration format is the same as the subnet mask rules in section

3.1.2.

Function: Identify the server as belonging to Class A, B, or C networks

#### Gateway

Configuration options: The configuration format is the same as the IPv4 address rules in section 3.1.2.

Function: The IP address of the next routing device that the data passes through before reaching the destination address

### Interface

Configuration options: None, ge0, eth0, eth1, sfp0, sfp1

Function: The current route takes effect on the selected interface (gateway configuration must be in the same network segment as the current interface in order to be applied normally)

## **4** Application

## 4.1 Mail Alarm Setting

### 4.1.1 Introduction

The Mail Alert feature is used to send an alert message to a specified recipient (typically a network administrator). Periodically send the device IP, CPU/Mem to the network administrator by mail, so that the administrator can know the corresponding information in time.

The device supports sending alert messages to the following two types of events:

• IP: The device periodically emails its own IP information.

• CPU/Mem: The device periodically emails real-time usage of its own CPU and memory.

#### 4.1.2 Web Page Configuration

Mail alarm configuration, as shown in Figure 9;

+ Film	日本市路径 主席 >> 在市 町中市安全市	>> antarball			
N/II 助件教誓说道		8			
MACHSHEIZIMIRE 基本指管	BHR:P BHR:P				
34089788 2015/08	新行王朝 66年2月1日開	tday ₩			
rap- Falk	Mitt D. Store	CPU/Mem			
	的复数计模块方	£	43		

Figure 9 Mail Alert Configuration

#### **Enable Mail Alerts Client**

Configuration Options: Enable/Enable

Default Configuration: Not Enable

Function: Whether the mail alarm function is enabled.

#### Mail sending server address

Configuration format: Correctly formatted IP address

Function: Configure the address of the sending mail server.

#### Mail account address password

Configuration range: The correct format of the mail server account address, login password

Function: Configure access to the mail server account password.

#### **Mail Subject**

Configuration range:  $0 \sim 40$  characters, special characters are not allowed.

Function: Alarm subject of receiving mail

#### Mail alarm cycle

Configuration Options: 1min/5min/20min/1hour/1day

Function: Configure the cycle for sending mail alerts

#### Mail alarm receiver

Configuration range: Legal email address

Function: The recipient receives the alarm subject of the mail

Note: Up to 4 can be added, click ៉ Add Account, click 🛎 Delete Account

4.1.3 Typical Configuration Example

The mail alarm example configuration is shown in Figure 10:

	Path: Home >> Applicati	on >> Email Settings	
Network	Email Settings		
-Application		-	
Email Settings	Enable Ernail Warning	2	
MAC Address Filter Settings	Email Server	192.168.1.6	
Rasie Alarm	Email Account	test@kyland.com	
Dasic Alarm	Email Password		
Power Down Alarm Settings	Subject	mailalarm-test	
Clock Server	Email Warning Curle	1 day 👻	
+User +System	Email Warning Content		
in a second s	Email To	test@kyland.com	82

Figure 10 Example OF Mail Alarm Page Configuration



## Note:

This device logs in to the server through the SMTP protocol to send emails. If the server is a QQ email, it is necessary to enable SMTP separately on the QQ email page, and contact the service provider for other email addresses.

## 4.2 MAC Address Filter Settings

### 4.2.1 Introduction

MAC address filtering refers to filtering the MAC addresses of hosts accessing the network through devices, prohibiting or only allowing some hosts to access the network through devices.

Whitelist: Whitelist is the user who can pass the setting, and users outside the whitelist cannot pass.

Blacklist: Blacklist is set to users who cannot pass, and users outside the blacklist can pass.

### 4.2.2 Web Page Configuration

MAC address filtering settings, as shown in Figure 11;

	Path: Home >> Application >	> MAC Address Filter Setting	\$
+Network	MAC Address Filter Settings		
-Application	Enable Mac FireWall		
MAC Address Filter Settings	Mac FireWall Mode	blacklist 🗸	
Basic Alarm	MAC Address	Remark	-
Power Down Alarm Settings			* 1
Clock Server	Apply		
+User			
+ System			

Figure 11 MAC Address Filter Setup Page

#### **Enable MAC Address Filtering Settings**

Configuration Options: Enable/Not Enable

Default Configuration: Not Enable

Function: Configure whether the MAC address filtering function is turned on.

#### **MAC Address Filtering Mode**

Configuration Options: Blacklist/White List

Default Configuration: Blacklist

Function: Configure whether the filtering mode is white list or black list.

#### **MAC Address and Notes**

Configuration range: MAC address format xx: xx: xx: xx or xx-xx-xx-xx-xx-xx, x is

hexadecimal number, remarks are not required, customized according to customer requirements, up to 4 new

MAC addresses can be added, click Add entry, click Delete entry, and click < Apply > to confirm.

# CAUTION

#### Note:

Please use the black/white lists with caution. Incorrect settings of the black/white lists can result in inability to access this device, and can only be recovered by resetting the blacklisted device by either the debug serial port or by pressing and holding the Reset button for a long period.

## 4.3 Basic Alarm

#### 4.3.1 Introduction

Alarm management can monitor the specified alarm variables CPU utilization and memory utilization. After the user defines the alarm entry, the system will obtain the value of the monitored alarm variable regularly. When the value of the alarm variable is greater than or equal to the upper threshold, an alarm event will be triggered.

#### 4.3.2 Web Page Configuration

Configure the basic alarm, as shown in Figure 12;

+Network	Basic Alarm		
Application	Cond Product		
Email Settings	Enable Basic Alarm		
MAC Address Filter Settings	External Alarm Server	0.0.0.0	
Rasic Alarm	External Alarm Server Port		
Power Down Alarm Settings	External Alarm Server Protocol	TCP ¥	
+Clock Super	Alarm Type	Enable	Threshold
PCIDER SERVER	CPU Availability Alarm		50 %
ruser	Memory Availability Alarm		50 %
Power Down Alarm Settings +Clock Server +User +System	Alarm Type CPU Availability Alarm Memory Availability Alarm	Enable	Threshold 50% 50%

Figure 12 Configuring Basic Alarm

#### Enable basic alarm

Configuration Options: Enabled/Not Enabled

Function: Whether to enable the basic alarm service

#### External alarm server

Configuration range: A.B.C.D, legal IP address

Function: Configure the IP address of the server for external alarm reception.

#### External alarm server port

Configuration range:  $1 \sim 65535$ 

Function: Configure the port of the server that receives the alarm externally.

#### External alarm server protocol

Configuration Options: TCP/UDP

Function: Communication protocol with external server, if the other party is TCP server, select TCP; If

it is UDP Server, select UDP

#### Alert Type

Configuration Options: CPU Utilization Alert, Memory Utilization Alert

Function: After activation, if the device's CPU and memory utilization rates exceed the threshold, an alert event will be triggered.

#### Threshold (%)

Configuration Range: 50~100

Default Configuration: 50

Function: Set the CPU/Memory utilization threshold, and generate a CPU/Memory utilization exceedance alert when the device's CPU/Memory utilization rate is higher than this value.



#### Note:

 $\triangleright$ 

The basic alarm function itself needs certain CPU and memory resources to trigger the alarm. If the CPU and memory utilization rate of the device is too high, for example, the memory utilization rate reaches 98%, it can no longer send alarm information to the outside.

## 4.4 Power Failure Alarm

#### 4.4.1 Introduction

When enabled, the device monitors the system voltage. When the system voltage drops to a low voltage value, the circuit will detect and respond, triggering a power outage alarm function, and sending alarm information to the device administrator through UDP or SNMP protocol.

#### 4.4.2 Web page configuration

Power failure alarm configuration and display, as shown in Figure 13;

KYLAND		
	Path: Home >> Application >>	Power Down Alarm Settings
+Network	Power Down Alarm Settings	
-Application		1.14
Email Settings	Enable Power Down Alarm	
MAC Address Filter Settings	Alarm Protocol	UDP V
Rasic Alarm	External Alarm Server	
Power Down Alarm Settings	External Alarm Server Port	
Clock Server	Alarm Content	
+User	Apply	
+System	Autoritation (	

Figure 13 Power-down Alarm

#### Enable power failure alarm

Configuration Options: Enable/Not Enable Default Configuration: Not Enable

Function: Whether power alarm is enabled.

#### Alarm protocol

Configuration Options: UDP/SNMP Default Configuration: UDP

Function: What protocol is the alarm information forwarded, if the receiving information is a UDP

server, then enable UDP; If the SNMP server receives information, SNMP is enabled.

#### **External Alarm Server**

Configuration Range: A.B.C.D, a valid IP address

Function: Configure the IP address of the server that receives power outage alarms externally.

#### **External Alarm Server Port**

Configuration Range: 1~65535

Function: Configure the port of the server that receives alarms externally.

#### **Alert Content**

Configuration Range: 5~31 characters, only English characters are allowed

Function: The content of the message sent to the alarm server when an alarm is triggered.

## **5** Clock Server

## **5.1** Synchronization Source Parameters

#### **5.1.1** Introduction

PTS-DR200L supports automatic tracking and locking of external BDS, GPS and GLONASS satellite absolute time reference and IEEE1588 and IRIG-B ground-based time reference. At the same time, a high-stability wide-temperature crystal oscillator is adopted to establish an internal high-stability reference frequency source. When all external sources are lost, the device enters the local punctuality, which can continuously ensure the accuracy of timing time signals. In satellite mode Auto, clock products select the best galaxy from BDS, GPS and GLONASS to lock; When F-BDS, F-GPS and F-GLN are switched, the number of stars searched from the designated galaxy pair is the number of satellites in the designated galaxy that have been searched at present.



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#### **Description:**

It is important to note that the efficiency of satellite acquisition is affected not only by the GPS module of this product but also greatly by the location of the antenna deployment. It is recommended to place the outdoor antenna in an open and unobstructed location, with the rooftop of a generally tall building being preferable.

#### 5.1.2 Web Page Configuration

Click the "Synchronization Source Parameters" menu in the left navigation bar of the page, and the clock synchronization source parameter information will be displayed in the interface. The switching channel source is shown in figs. 14, 15 and 16;

KYLAND					
	Path: Hor	ne >> Clock Server >> Clock Sync	Config		
+Network	Clock Sync	Config			
+ Application = Clock Server	Source Cha	nnel: [SAT	•		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	i t	Source Priority	Level-1	×	
NTP Config	2	Antenna Compensation	0		-9999999999-9999999999(mg)
PTP Config	3	Source Mode	SYNC	~	
Output Config	4	Satellite Mode	Auto	*	
SNMP Manager	Basic Inform	nation			
Source Status	Index	Name	Parameter		Ramon
Clock Status	1	Working Mode	Single	~	i i i i i i i i i i i i i i i i i i i
+User	- Andrews	The same man	Compo	- All	
+System	Apply				



#### PTS-DR200L Rack Clock Server

## KYLAID

KYLAND					
	Path: Home >> (	Clock Server >> Clock Sync Config	1		
+Network	Clock Sync Config				
+Application	Service Channels	1010.8			
-Clock Server	source channel:	INIO-D +			
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-3	*	
NTP Config	2	Source Mode	SYNC	~	
PTP Config	3	Time Format	DC+	*	
Output Config	4	UTC Offset	0		-12-12(h)
SNMP Manager	Basic Information:				
Source Status	Index	Name	Parameters		Range
Clock Status	1	Working Mode	Single	<b>v</b>	Constant of the
+User				100	
+System	Apply				



KYLAND					
	Path: Home >> C	lock Server >> Clock Sync C	onfig		
r Nelfwork	Clock Sync Config				
-Clock Server	Source Channel:	PTP	v		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-2	*	1000
NTP Config	2	Source Mode	SYNC	~	
PTP Config	Basic Information				
Output Config		Name	Parameters		Eanne
SNMP Manager	1	Working Mode	Single	~	
Source Status		The second second	Salar		
Clock Status	Apply				
+User	and the second s				
FSystem					

Figure 16 PTP Configuration Parameters

#### 1. Configure Source Channel Parameters

#### Priority

Configuration options: Level-1~10

Default configuration: Level-1

Function: Set the reference sequence for the priority of external source signals, where 1 is the highest priority source and 10 is the lowest priority source.



When switching SAT, IRIG-B and PTP source channels, the default priority configuration may be different, and according to the characteristics of source channels, the corresponding parameters will also change accordingly, such as SAT configuration parameters "priority, antenna delay, mode, satellite mode", IRIG-B configuration parameters "priority, mode, format, UTC" and PTP configuration parameters "priority, mode".

The default priority of the local clock signal is also Level-10. When the external valid source is set to Level-10, the external source will automatically switch to local timekeeping after being locked.

#### **Antenna Delay**

Note:

Configuration options: -999999999~999999999 (ns)

Default configuration: 0

Function: Set the antenna delay compensation for the satellite channel receiver module according to different antenna types and lengths.

#### Mode

Configuration options: SYNC/PEER/NONE

Default configuration: SYNC

Function: Set the working mode of the time source. SYNC represents the system reference

source, PEER represents the associated source, and NONE indicates not to use the time source role.

#### **Satellite Mode**

Configuration options: Auto/F-BDS/F-GPS/F-GLN

Default configuration: Auto

Function: Set the working mode of each satellite channel receiver module (Auto automatic/F

#### forced).

#### Format

Configuration options: DC+/DC-

Default configuration: DC+

Function: Set the IRIG-B time format, including the selection of positive or negative polarity.

#### UTC

Configuration range: -12~12(h)

Default configuration: 0

Function: Set the time difference compensation between UTC and IRIG-B.

#### 2. Configure Basic Information Parameters:

#### **Working Mode**

Configuration range: Multi-source/Single-source

Default configuration: Multi-source

Function: Single-source effective mechanism (as long as there is one valid external SYNC

source, it can work), multi-source effective mechanism (refer to the inputs of SYNC and PEER sources, and select a better source as the reference source).

## 5.1.3 Typical Configuration Example

When selecting the satellite synchronization source of space-based signal for alignment, the satellite synchronization source can be locked according to the following six steps:

The first step is to configure the priority of satellite synchronization source as Level-1, and the synchronization source with high priority is locked first;

	Path: Hor	ne >> Clock Server >> Clock Sync	: Config		
Application	Clock Sync	Config			
-Clock Server	Source Cha	nnel: SAT	*		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-1	*	
NTP Config	2	Antenna Compensation	0		-999999999 - 999999999 (ns)
PTP Config	1	Source Mode	SYNC	*	
Output Config	4	Satellite Mode	Auto	*	
SNMP Manager	Basic Inform	nation			
Source Status	Index	Name	Paramete		Panne
Clock Status	1	Working Mode	Single	~	
+User		in the second second	Contrare.	81	

Figure 17 Priority configuration

The second step is to configure the antenna time delay as 0, and adjust the output time accuracy by compensating the antenna time delay according to the deviation of the output time signal;

n/Lait	Path: Hor	ne >> Clack Server >> Clack Sync	Config		
+ Network	Clock Sync	: Config			
+Application			221		
-Clock Server	Source Cha	anel: SAI	~		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-1	*	
NTP Config	2	Antenna Compensation	0		-999999999 - 999999999 (ns)
PTP Config	3	Source Mode	SYNC	~	
Output Config	4	Satellite Mode	Auto	*	
SNMP Manager	Basic Inform	mation			
Source Status	Index	Name	Parameter		Range
Clock Status	1	Working Mode	Single	~	
+User		and the second se		21	
+System	Apply				

Figure 18 Antenna Delay Configuration

The third step, the configuration mode is SYNC;

KYLAND					
	Path: Hor	ne >> Clock Server >> Clock Sync	Config		
+ Network	Clock Sync	Config			
+Application					
-Clock Server	Source Cha	nnel: SAT	~		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-1	*	
NTP Config	2	Antenna Compensation	0		-999999999 ~ 999999999 (ns)
PTP Config	1	Source Mode	SYNC	~	
Output Config	4	Satellite Mode	Auto	~	
SNMP Manager	Basic Inform	nation			
Source Status	Index	Name	Parameter		Panne
Clock Status	1	Wading Made	Single		- ange
t User		maning mode	Guide		
+System	Apply				

#### Figure 19 Mode configuration

The fourth step is to configure the satellite mode Auto, which means that the best signal is selected from BDS, GPS and GLONASS galaxies for timing, and the finally selected timing galaxy can be viewed from the display screen;

KYLAND					
	Path: Hor	ne >> Clock Server >> Clock Sy	ne Config		
+ Network	Clock Sync	Config			
+Application					
-Clock Server	Source Cha	innel: SAT	~		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-1	*	
NTP Config	2	Antenna Compensation	0		-9999999999-9999999999(ns)
PTP Config	3	Source Mode	SYNC	*	
Output Config	4	Satellite Mode	Auto	*	
SNMP Manager	Basic Inform	nation	1		
Source Status	Index	Name	Parameter		Ranne
Clock Status	1	Working Mode	Single	~	range.
+User		Transing more	Contrate	<u></u>	
+System	Apply				

Figure 20 Satellite Mode Configuration

The fifth step is to configure multi-source working modes;

KYLAND	7				
	D Pathe Horn	ne >> Clock Server >> Clock Sync	Config		
+ Network	Clock Sync	Config			
+Application Clock Server	Source Cha	nnel: SAT	v		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Source Priority	Level-1	•	
NTP Config	2	Antenna Compensation	D		-99999999999-9999999999(ma)
PTP Config	1	Source Mode	SYNC	~	
Output Config	4	Satellite Mode	Auto	~	
SNMP Manager	Basic Inform	nation:			
Source Status	index.	Marrie	Paramete		Eanor
Clock Status	1	Working Mode	Multiple	~	the state of the s
HUter	1.10	read and a second	Local Control of Contr	- 52	
+System	Apply				

Figure 21 Operating Mode Configuration

The sixth step is to connect an effective antenna to the BNC port and wait for a period of time before the ANT and SAT lights of the device (with a search for more than 4 stars) remain on continuously. Then, wait for about 5 minutes for the Lock light to flash for 1 second per time, indicating that the device has selected satellite synchronization source lock. You can check the current synchronization source display as SAT in the clock status, check the satellite status and search for more than 4 stars in the synchronization source status, and display information such as locked galaxies on the LED screen

	Path: Home >> 0	lock Server >> Source Status		
Network	Source Status			
Application	L sources L			
Clock Server	Source Channel:	SAT 👻		
Clock Sync Config	Index	Name	Status	
Clock Config	1	Source Status	Normal	
NTP Config	2	Satellite Number	16	
PTP Config	3	Antenna Status	Normal	
Output Config	4	Source Bump Status	Normal	
SNMP Manager	5	Source Priority	1	
Source Status	Defeat			
Clock Status	Revesi			
Uer				



KYLAND	)			
	Path: Home >	> Clock Server >> Clock Status		
+Network	Clock Status			
+Application	index	Name	Status	
Clock Sync Contin	3	Selected Source	SAT	
Clock Config	2	Initial Status	Initialized	
NTP Config	1	Hold Status	Tracking	
PTP Confin	4	Power Status	Normal	
Octave Config	5	Frequency	124999988	
Output Coning	6	Longitude	111.2026496	
SNMP Manager	7	Latitude	30.6847072	
Source Status	8	Height	98	
Clock Status	0	Version	0x0203	
+User	100 million (1990)	The second second		
+System	Refresh			

Figure 23 Clock status



Figure 24 LED screen display

#### 5.2 Clock Parameter

#### 5.2.1 Introduction

Clock parameters include two parts. The first part of basic information configures time reference, clock time zone, time difference between TAI and UTC, and output mode. According to the leap second announcement from the National Time Service Center, the most recent leap second adjustment occurred at UTC time 0 hours, 0 minutes, and 0 seconds on January 1, 2017. After this leap second adjustment, the relationship between UTC and TAI will be: UTC-TAI = -37s. The negative value indicates that UTC is 37 seconds slower than TAI, reflecting the long-term trend of the Earth's rotation slowing down.

The second part of summer time is a system to adjust the time zone for the purpose of saving energy, the main purpose is to let people enjoy more light and make full use of natural resources during the day. The output time of the summer time clock product is UTC plus summer time deviation, and the output time of the clock product after summer time is UTC time.

#### 5.2.2 Web Page Configuration

Click on the "Clock Parameters" menu in the navigation bar on the left side of the page, and the clock parameter information will be displayed in the interface. Contains basic information and summer time configuration information.

1. Configure the basic clock information, as shown in Figure 25;

- Network	Clock Config					
Application	Basic Informa	tion:				
Clock Server			Barrow Marrow			
Clock Sync Config	intex	Name	Parameters		REA	9e
Clock Config	1	Time Reference	UIC	•		
NTP Config	2	Time Zone	0		-12	-12(h)
PTP Config	3	TAI UTC Offset	37		-32	768~32767(s)
Output Config	4	Output Mode	Lock	¥		
SNMP Manager	Summer Time	N				
Source Status	Index	Name	Parameters			Range
Clock Status	1	DST Offset	0			-12-12(h)
FUser	2	DST Mode	UTC	*		
+System	3	Start Index	1st	×		
	4	Start Weekday	SAT	¥		
	5	Start Month	JAN	~		
	6	Start Time	00.00			00:00-24:00
	7	Stop Index	1st	~		
	8	Stop Weekday	SAT	*		
	9	Stop Month	FEB	~		
			Contraction of the second s	200		

Figure 25 Basic information configuration of clock parameters

#### **Time reference**

Configuration options: UTC/TAI

Default configuration: UTC

Function: Configure the time reference used by time, UTC or TAI time as the time reference. The device fixedly uses UTC reference for satellite synchronization source and IRIG-B code synchronization source input signals, and the current configuration item is only valid for PTP synchronization source.

#### **Clock time zone**

Configuration options:  $-12 \sim 12$  (h)

Default configuration:0

Function: Configure the time zone difference of time,  $-12.00 \text{ h} \sim +12.00 \text{ h}$ .

#### Time difference between TAI and UTC

Configuration Options: -32768 ~ 32767 (s)

#### Default Configuration: 37

Function: Configure the time difference between TAI and UTC. When the device processes the leap second forecast information of external synchronization source, it will automatically revise the current configuration. For example, after receiving and processing the positive leap second notice, the time difference between TAI and UTC is automatically increased by one; After receiving and processing the negative leap second forecast, the time difference between TAI and UTC is automatically reduced by one.

#### **Output mode**

Configuration Options: Permanent/Synchronization

Default Configuration: Permanent

Function: Configure the time signal output mode. In the permanent mode, the device will output the time signal after being powered up and started. In the synchronous mode, the output signal can only be obtained after the time is synchronized and locked with the external source.

2. Configure summer time information, as shown in Figure 26:

+Network	California de		Contract Inc.			
+Application	Clock Config					
-Clock Server	Basic Inform	rtion:				
Clock Sync Config	Index	Name	Parameters		Ra	nge
Clock Config	1	Time Reference	UTC			
NTP Config	2	Time Zone	0		-12	2-12(6)
PTP Config	3	TAI UTC Offset	37		-32	2768~32767(s)
Output Config	4	Output Mode	Lock	~		
SNMP Manager	Summer Tim	e1.				
Source Status	Index	Name	Parameters			Range
Clock Status	1	DST Offset	0			-12-12(h)
+User	2	DST Mode	UTC	*		
+ System	3	Start Index	1st	~		
	4	Start Weekday	SAT	*		
	5	Start Month	JAN	×		
	6	Start Time	00.00			00:00-24:00
	7	Stop Index	1st			
	8	Stop Weekday	SAT	*		
	9	Stop Month	FEB	~		
	10	Stop Time	00.00	1		00:00-24:00

Figure 26 Time clock parameter summer time configuration

#### Summer time deviation

Configuration options:  $-12 \sim 12$  (h)

Default configuration: 0

Function: Set how many hours summer time needs to be adjusted, and set the summer time deviation to 0 to indicate that summer time function is turned off.

#### Summer time mode

Configuration Options: UTC/LOCAL

Default Configuration: UTC

Function: Set the reference time benchmark used by summer time.

#### Start serial number

Configuration Options: First/Second/Third/Fourth/Fifth/Last

Default Configuration: First

Function: Set the start date of summer time in combination with the start week.

#### Start week

Configuration Options: Sunday/Monday/Tuesday/Wednesday/Thursday/Friday/Saturday

Default Configuration: Saturday

Function: Set the start date of summer time with the start sequence number.

#### Start month

Configuration Options:

January/February/March/April/May/June/July/August/September/October/November/December

Default Configuration: January

Function: Set the start month of summer time.

#### Start time

Configuration Options:  $00:00 \sim 24:00$ 

Default Configuration: 00:00

Function: Set the start time of summer time.

#### Stop sequence number

Configuration Options: First/Second/Third/Fourth/Fifth/Last

Default Configuration: First

Function: Set the stop date of summer time in combination with the stop week.

#### Stop week

Configuration Options: Sunday/Monday/Tuesday/Wednesday/Thursday/Friday/Saturday

Default Configuration: Saturday

Function: Set the stop date of summer time in combination with the stop sequence number.

#### **Stop month**

Configuration Options:

January/February/March/April/May/June/July/August/September/October/November/December

Default Configuration: February

Function: Set the stop month of summer time.

#### Stop time
Configuration options:  $00:00 \sim 24:00$ 

Default configuration: 00:00

Function: Set the stop time of summer time.

## 5.2.3 Typical Configuration Example

To configure summer time, you can configure the first step according to the following steps:

The first step is to configure the summer time deviation of 2 hours;

4 Natarok			2010			
A Annalizations	Clock Config					
Trapposed and	Basic Informa	tion				
Clock Sume Combo	Index	Name	Parametera		Range	
Clock Confin	1	Time Reference	UTC			
NTR Config	2	Time Zone	0		-12-120	0
RTP Config	3	TAI UTC Officet	37		-32768-	32767(x)
Pir Conig	4	Output Mode	Lock	· •		
Couput Coring	Summer Time					
SPORP Manager	Transfer for	and a second sec	Contraction of the local division of the loc		10.040	
Source Status	Index	Name	Parameters		Ra	001
Clock Status	1	OST Offset	2		-12	2-12(h)
Hüser	2	DST Mode	UTC	~		
+System	3	Start Index	Tat	~		
	4	Start Weekday	SAT	~		
	5	Start Month	JAN	~		
	6	Start Time	00.00	16	00	00~24:00
	7	Stop Index	Tst	~		
		Stop Weekday	SAT	~		
	9	Stop Month	FEB	¥.		

Figure 27 Summer time Deviation

The second step is to configure the summer time mode UTC;

Network:	Clock Coofe				
oplication					
Clock Server	Basic Informa	rtion:			
Clock Sync Config	Index	Name	Parameters	100	Range
Clock Config	1	Time Reference	UTC	*	
NTP Config	2	Time Zone	0		-12~12(h)
PTP Config	3	TAI UTC Offset	37		~32768~32767(s)
Output Config	4	Output Mode	Lock	*	
SNMP Manager	Summer Tim	*:			
Source Status	Index	Name	Parameters		Range
Clock Status	1	DST Offset	2		-12-12(h)
User:	Z	DST Mode	UTC	¥	
System	3	Start Index	Tst	*	
	4	Start Weekday	SAT	*	
	5	Start Month	JAN	*	
	6	Start Time	00.00		00:00-24:00
	7	Stop Index	Tst	*	
		Stop Weekday	SAT	*	
	9	Stop Month	FEB	*	
	10	Stop Time	00 00		00:00-24:00

Figure 28 Summer time Mode

The third step is to configure the start time of summer time, including the start serial number, the start week, the start month and the start time

	Path: Home	e >> Clock Server >> Clock C	onfig		
+Network	Clock Config				
+Application	Basic Inform	(dag)			
-Clock Server	Dask months	PDGHI			and the second se
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Time Reference	UTC	~	
NTP Config	2	Time Zone	0		-12-12(h)
PTP Config	3	TAI UTC Offset	37		-32768-32767(s)
Output Config	4	Output Mode	Lock	*	
SNMP Manager	Summer Tim	e1			
Source Status	Index	Name	Parameters		Range
Clock Status	3	DST Offset	2		-12-12(h)
User	2	DST Mode	UTC	*	
+System	3	Start Index	1st	~	
selfande -	4	Start Weekday	SAT	~	
	5	Start Month	JAN	~	
	6	Start Time	00.00		00:00-24:00
	7	Stop Index	Tat	*	
	8	Stop Weekday	SAT	*	
	0	Stop Month	FEB	*	

Figure 29 Summer time Start Time

The fourth step is to configure the summer time, month, day, hour and second, including stop serial number, stop week, stop month and stop time.

- Manhamarka						
- Amerikanikan	Clock Config	E				
- rippetason	Basic Informa	itioni				
Clock Suns Confin	Index	Name	Parameters		Range	
Clock Config	1	Time Reference	UTC	v		
NTP Confin	2	Time Zone	0		-12-12	(h)
PTP Coefin	3	TAI UTC Offset	37		-32768-	-32767(s)
Output Coefin	4	Output Mode	Lock	•		
SNMP Manager	Summer Tim	e)				
Source Status	Index	Name	Parameters			ange
Clock Status	1	DST Offset	2			12~12(h)
User	2	DST Mode	UTC	~		
System	3	Start Index	1st	*		
	4	Start Weekday	SAT	~		
	5	Start Month	JAN	*		
	6	Start Time	00.00		0	0:00~24:00
	7	Stop Index	İst	~		
	8	Stop Weekday	SAT	~		
	9	Stop Month	FEB	~		
	10	Stop Time	00.00		0	0:00-24:00



Upon application, when the UTC time reaches the start time of Summer time (DST), DST takes effect, and the clock output time will be UTC+2. When the UTC time exceeds the end time of DST, DST becomes ineffective, and the clock product will output the UTC time. Once the time surpasses the end of DST, DST is no longer in effect, and the clock product outputs the UTC time.

## **5.3 NTP Parameters**

## 5.3.1 Introduction

Network Time Protocol (NTP) is a protocol used to synchronize the clocks of devices within a network to ensure that all devices have consistent timekeeping, enabling a variety of applications based on a unified time standard. It offers high precision time correction (with a difference of less than 1 millisecond on LANs and several tens of milliseconds on WANs), and it can prevent protocol attacks through encrypted confirmation methods.

## 5.3.2 Web Page Configuration

Click the "NTP Parameters" menu in the left navigation bar of the page, and the NTP parameter information will be displayed in the interface:

KYLAND					
	Path: Home	>> Clock Server >> NTP Cor	sha		
+Network	NTP Cordia	1	S		
+Application	E STATE OF STATE				
-Clock Server	Index	Name	Parameters		Range
Clock Sync Config	1	NTP Server	Enable	¥	
Clock Config	Apply	Export Key			
* NTP Config	untria u				
PTP Config					
Output Config					
SNMP Manager					
Source Status					
Clock Status					
+User					
+System					

Figure 31 Configuring NTP Parameters

#### **NTP Server**

Configuration options: Enable/Disable

Default configuration: Enable

Function: To turn on or off the NTP server functionality.

#### **Export Key**

Function: Export keys via the web interface for MD5 authentication. The MD5 value of a file is like the "digital fingerprint" of the file. Each file has a unique MD5 value, and if anyone makes any changes to the file, the corresponding "digital fingerprint" (i.e., the MD5 value) will change.

## 5.3.3 Typical Configuration Example

Select NTP for timing, which can be configured according to the following three steps:

The first step is to enable the NTP server of the clock server

KYLAND					
	Path: Home	>> Clock Server >> NTP Cor	nlig		
+Network	NTP Config	T			
+Application	Propriet and	Contract of			1 Pressoon
-Clock Server	Index	Name	Parameters		Range
Clock Sync Config	1	NTP Server	Enable	*	
Clock Config	Apply	Export Key			
* NTP Config	unitation of				
PTP Config					
Output Config					
SNMP Manager					
Source Status					
Clock Status					
+User					
+System					

#### Figure 32 Enabling NTP Server

The second step is to modify the local time on the PC side

Date and Time	×
Date and Time Additional Clocks Internet Time	
Date: Tuesday, April 2, 2024 Time: 1:09:41 PM Time zone (UTC+08:00) Beijing Changging Hong Kong Unumgi	
Change time zone	
Daylight Saving Time is not observed by this time zone.	
OK Cancel Apply	i,

Figure 33 Modifying PC Local Time

The third step is to initiate the NTP client on the PC to request time synchronization from the NTP server. Once the synchronization is successful, the local time on the PC returns to normal.

	ime			
Jate and Time	Additional Oc	odis Enternet Time Date: Tuesday, April	2, 2024	
Time zone (UTC+08:00	Beijing Cho	Time: 5:00:33 PM	Change da	te and time
2.0			Change ti	me zone
Daylight Sa	wing Time is r	not observed by th	is time zone.	

Figure 34 NTP Client Timing



#### Note:

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After the NTP server of the clock server is enabled, all network ports (1 gigabit electrical port, 2 fast Ethernet electrical ports,2 fast Ethernet optical ports) can time the lower computer device, and the server IP is the IP of the network port, for example, the IP of the ge0 time service server is 192.168. 0.111, The IP of the external time server for sfp0 is 192.168.3.111.

#### **5.4 PTP Parameters**

#### 5.4.1 Introduction

PTP (Precision Time Protocol) is a protocol used for achieving network clock synchronization. It is one of the protocols specified in the IEEE 1588 standard and is also known as the "1588v2 clock synchronization protocol."

This high precision can meet the requirements of applications that demand high accuracy in clock synchronization, such as audio and video transmission, industrial automation, test and measurement, and fields requiring precision measurement.

According to different configurations, PTP of PTS-DR200L can be used as synchronization source Slave Clock to obtain time information from Master Clock for timing, and can also be used as Master Clock for timing to external devices. To ensure reliable clocks, multiple clock sources are usually deployed in PTP domains. Usually, the clock is provided by a clock source with high priority. If the clock source fails, BMC algorithm will re-elect the optimal clock, and build the shortest path tree with the new optimal clock as the root to provide time for PTP domain.

# **5.4.2** Web Page Configuration

Click the "PTP Parameters" menu in the navigation bar on the left side of the page, and the PTP parameter information will be displayed in the interface, as shown in Figure 35:

An Inc. of the	Ser Piece Press	in a clock server a a ris coming			
Network	PTP Config				
Application	Plur street	- Contractor	Constant of the local sectors of the		10000
Clock Server	Index	Prome -	MACTED	14	Kange
Clock Sync Config		PTP Mode	MASTER		
Clock Config	2	Delay Measurement Mode	P2P		
NTP Config	3	Sync Interval	STOP	~	
PTP Config	4	Delay Measurement Interval	STOP	~	
Output Config	5	Domain1	0	~	
SNMP Manager	6	Domain2	0	~	
Source Status	7	Domain3	0	*	
Clark Status	8	Domain4	0	~	
CIOOK STATUS	9	Domain5	0	~	
Huser	10	Priority1	0	2.2	0~255
System	11	Priority2	1		0~255
	12	PTP Media	802.3	*	
	13	Tx Compensation	0		-1900000~1900000(ns)
	14	Rx Compensation	0		-1900000-1900000(mt)
	15	vLan Enable	NO	~	
	16	vLan Priority	0		0-7
	17	vLan CFI	0	*	
	18	vLan TagiD	0		0~4095
	19	Master Coordination	NO	~	

Figure 35 Configuring PTP Parameters

## **PTP Mode**

Configuration options: Master/Slave/Boundary

Default configuration: Master

Function: Set the working mode of PTP, and support setting three working modes

(1) Master: The clock synchronization source to which other clocks will be synchronized;

(2) Slave: The clock that needs to be synchronized with the master clock

(3) Boundary: There are multiple ports connected to the clock of the network, one slave port is connected to the master clock port of the upstream device, and the other ports are connected to the slave port of the downstream device as the master. The downstream slave port isomorphic PTP protocol is directly synchronized with the boundary clock.

#### **Delay Measurement Mode**

Configuration options: E2E / P2P / Disable

Default configuration: P2P

Function: To set the time delay measurement mode or disable this mode;

(1) P2P: Equivalent Delay Mechanism, where each device in the network exchanges peer-delay measurement information with other devices, allowing each device to track the delay between itself and its neighboring devices.

(2) E2E: Delay Request-Response Mechanism, where devices send delay measurement information to the master device.

#### Sync Interval

Configuration options: 0~4 / Stop

Default configuration: Stop

Function: To set the frequency of sending entire primary time synchronization messages. The setting value n represents an actual interval of 2<sup>n</sup> seconds.

#### **Delay Measurement Interval**

Configuration options: 0~4 / Stop

Default configuration: Stop

Function: To set the rate of delay measurement for PTP functionality. The setting value n represents

39

an actual interval of  $2^n * 10$  seconds.

#### Domain 1~5

Configuration options: 0~3

Default configuration: 0

Function: To set the working domain of PTP messages. There may be multiple PTP domains in a network, where each PTP domain is an independent PTP clock synchronization system. There is only one clock source within a PTP domain, and all devices in the domain synchronize with this clock source.

#### Priority 1/2

Configuration options: 0~255

Default configuration: 0/1

Function: To set the working priority of PTP messages.

#### **PTP Media**

Configuration options: 802.3 / IPV4

Default configuration: 802.3

Function: To set the type of PTP transmission protocol, supporting IEEE802.3 mode or IPv4.

#### Send Delay

Configuration options: -1900000~1900000(ns)

Default configuration: 0

Function: To set the send delay of PTP messages.

#### **Receive Delay**

Configuration options: -1900000~1900000(ns)

Default configuration: 0

Function: To set the receive delay of PTP messages.

## VLAN Allow

Configuration options: Yes / No

Default configuration: No

Function: To set whether to send VLAN information.

## **VLAN Priority**

Configuration options: 0~7

Default configuration: 0

Function: To set the priority of VLAN.

## VLAN CFI

Configuration options: 0~1

Default configuration: 0

Function: To set VLAN CFI information.

## VLAN TAGID

Configuration options: 0~4095

Default configuration: 0

Function: To set VLAN ID information.

## **Master Clock Coordination**

Configuration options: YES/NO

Default configuration: NO

Function: To enable or disable the BMC (Broadcast Message Coordination) functionality of the master clock.



Note:

In PTP domain, the selection of optimal clock and the establishment of port master-slave relationship all depend on the optimal clock BMC algorithm. BMC algorithm compares the data sets carried in Announce messages between clock nodes to select the optimal clock and determine the state of each PTP port.

The data set used by the BMC algorithm to select the optimal clock and determine the state of the PTP port includes the following information:

- (1) Priority1: Clock priority is 1, which supports user configuration. The value range is  $0 \sim 255$ . The smaller the value, the higher the priority.
- (2) Clock Class: Clock Class, defines the clock's ability to track International Atomic Time (TAI) for time or frequency.
- (3) Clock Accuracy: Clock accuracy, the lower the value, the higher the accuracy.
- (4) Offset Scaled Log Variance: Clock stability.
- (5) Priority2: Clock priority is 2, which supports user configuration. The value range is  $0 \sim 255$ . The smaller the value, the higher the priority.

When PTP device executes dynamic BMC source selection algorithm, the priority selection order is priority1 > Clock Class > Clock Accuracy > Offset Scaled Log Variance > Priority2, that is, first compare priority1 of the candidate time sources, and then compare clock-class if priority1 is the same, and so on, the clock with high priority, high level and good precision becomes the best clock. By changing the priority and level of the clock, the user can influence the selection of the master clock of PTP system, thus select the clock signal you want to synchronize. BMC algorithm can realize synchronous distribution and protection of PTP clock.

## 5.4.3 Typical Configuration Example

1. When selecting PTP as the synchronization source for alignment, you can configure it according to the following three steps:

The first step is to set the PTP mode to Slave, set Sync Interval and Delay Measurement Interval to 0, and keep the default values of other parameters unchanged;

letwork.	070 C				
	PTPComg				A CARLON CONTRACTOR
lock Server	Index	Name	Parameters	1	Range
inck Sunc Confin	3	PTP Mode	SLAVE	~	
lock Confin	2	Delay Measurement Mode	P2P	*	
TR Cooling	3	Sync Interval	0	~	
TP Config	4	Delay Measurement Interval	0	×	
re coning	5	Domain1	0	×	
Autput Coning	6	Domain2	0	×	
NMP Manager	7	Domain3	0	v	
iource Status	8	Domain4	0	¥	
Clock Status	9	Domain5	0	¥	
User	10	Priority1	0		0-255
iystem	11	Priority2	1		0-255
	12	PTP Media	802.3	¥	
	13	Tx Compensation	(0		-1900000~1900000(ms)
	14	Rx Compensation	0		-1900000~1900000(ns)
	15	vLan Enable	NO	*	
	16	vLan Priority	0		0-7
	17	vLan CFI	0	v	
	18	vLan TaglD	0		0~4095
	19	Master Coordination	NO	v	

Figure 36 Configuring PTP As A Slave Clock

The second step is to modify the parameter information of the synchronization source to ensure that the priority of the source channel PTP is the highest, for example, the priority of the PTP is set to Level-1 and the other sources are set to Level-2;

KYLAND	1					
	Path: Home >> C	lock Server >> Clock Sy	ne Config			
+Network	Clock Sync Config					
+Application		10000	1.56			
Clock Server	Source Channel:	PIP	~			
Clock Sync Config	Index	Name		Parameters		Range
Clock Config	1	Source Priority		Level-1	~	
NTP Config	2	Source Mode		SYNC	v	
PTP Config	Basic Information:					
Output Config		Marrie		Parameters		Ranne
SNMP Manager	1	Weeking Made		Multiple		Q*
Source Status		moneng mode		muspie		
Clock Status	Apply					
User						
System.						

Figure 37 Configuring synchronization source PTP Priority

By connecting an effective PTP master clock device via the network port and waiting for a period of time (approximately 5 minutes), the device's Lock light will flash once every second, indicating that the device has locked onto the selected PTP synchronization source. This can be viewed in the clock status where

the current synchronization source is displayed as PTP, at which point the clock device is synchronizing with the external PTP master clock device.

	Path: Home >	> Clock Server >> Clock Status		
+Network	Clock Status			
+Application	Excercision of		18272552	
-Clock Server	Index	Name	Status	
Clock Sync Config	1	Selected Source	PTP	
Clock Config	2	Initial Status	Initialized	
NTP Confin	3	Hold Status	Tracking	
DTD Confin	4	Power Status	Normal	
Pir Conig	5	Frequency	124999988	
Output Config	6	Longitude	111.2026368	
SNMP Manager	7	Latitude	30 6846784	
Source Status	8	Height	97	
Clock Status	9	Version	0x0203	

Figure 38 Clock Status

2. Select PTP as the master clock A to time the external device B, which can be configured according to the following three steps:

In the first step, set the PTP mode to Master, and keep the other parameters unchanged by default

	D Path: Hon	ne >> Clock Server >> PTP Config			
	PTP Config				
Application					and the second se
Clock Server	Index	Rame	Parameters	_	Range
Clock Sync Config	1	PTP Mode	MASTER	Y	
Clock Config	2	Delay Measurement Mode	P2P	~	
NTP Config	3	Sync Interval	0	~	
PTP Config	4	Delay Measurement Interval	0	~	
Output Coeffe	5	Domain1	0	~	
Child D Manager	6	Domain2	0	*	
Showr Manager	7	Domain3	0	¥	
Source Status	8	Domain4	0	*	
Clock Status	9	Domain5	0	¥	
	10	Priority/1	0		0~255
System	11	Priority2	1		0~255
	12	PTP Media	802.3	¥	
	13	Tx Compensation	0		-1900000-1900000(ms)
	34	Rx Compensation	0		1900000-1900000(Hs)
	15	vLan Enable	NO	¥	
	16	vLan Priority	0		0~7
	17	vLan CFI	0	*	
	18	vLan TagiD	0		0~4095
	10	Master Coordination	NO	4	

Figure 39 Configuring PTP as the Master Clock

In the second step, the slave clock device B (such as the device in the above scenario 1) is externally connected through the network port, and after waiting for a period of time (about About 5min), the Lock lamp of device B flashes for 1s/time, indicating that the device selects external synchronization source locking, and the current synchronization source can be displayed as PTP in the clock state. At this time, device A gives time to device B, and device B gives time to device A.



#### Notes:

- Ensure that the network interface IP addresses of devices A and B are in the same subnet and have the same domain value when setting up the network as shown in the above configuration example.
- The PTP settings on the clock server designate the master clock, allowing all network interfaces (1 gigabit electrical port, 2 fast Ethernet electrical ports, 2 fast Ethernet optical ports) to distribute time to lower-level devices. The server IP is the same as the IP of the network interface, for example, the time distribution server IP for ge0 is 192.168.0.111, and the time distribution server IP for eth0 is 192.168.1.111, The IP of the external time server for sfp0 is 192.168.3.111.

## **5.5** Output Parameter

#### 5.5.1 Introduction

In addition to outputting NTP and PTP time signals through the network port described in the above chapters, PTS-DR200L also supports various time output signals such as IRIG-B, 1PPS, 1PPM, 1PPH and TOD signals to meet the demand of time synchronization. The output signal types of BNC and COM interface can be configured by output parameters.

#### 5.5.2 Web Page Configuration

Click the "Output Parameters" menu in the navigation bar on the left side of the page, and the output parameter information will be displayed in the interface, as shown in Figure 40:

	Path: Hor	ne >> Clock S	erver >> Output Co	nīg		
*Network	Output Co	nfig				
Application			10000			
Clock Server	Output Cha	nnel:	COM	v		
Clock Sync Config	Index	Name		Parameters		Range
Clock Config	+	PP5		PPS	*	
NTP Config	2	Second Co	mpensation	0		-9999999999-999999999(s)
PTP Config	3	PPS Comp	ensation	0		-25000000-25000000(ns)
Output Config	4	Time Form	at	UTC	×	
SNMP Manager	5	Message F	ormat	NMEA-RMC	*	
Source Status	6	Interface 8	audRate	9600	¥	
Clock Status	Apply					
User	(CONT)					
System						

## Figure 40 COM Channel Output Parameters

KYLAND							
+Network	Output Co	ne >> Clack Si mSg	erver >> Output Con	fig			
+Application Clock Server	Output Cha	nnel:	BNC	•			
Clock Sync Config	Index	Name		Parameters		Range	
Clock Config	1	Output Sig	nal	IRIG-B	*		
NTP Config	2	Second Co	mpensation	0		-999999999 - 999999999(s)	
PTP Config	3	PPS Comp	ensation	0		-250000000-250000000(ns)	
* Output Config	4	IRIG-8 Mo	de	Odd	~		
SNMP Manager	5	RIG-8 Tim	e Format	UTC	*		
Source Status	6	IRIG-B Pol	arity	+	v		
Clock Status	Apply						
+User	Contract of						
+System							

## Figure 41 BNC Channel Output Parameters

KYLAND					
	D Path: Home >>	Clock Server >> Output Config			
+Network	Output Config	Contract of Section Annabel			
+Application -Clock Server	Output Channel:	[AC •			
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Peak-to-Peak Value	12.0V	*	in the second
NTP Config	2	Modulation Ratio Value	3.0.1	~	
PTP Config	( and		1.050.92		
Output Config	Apply				
SNMP Manager					
Source Status					
Clock Status					
HUser					
+System					

Figure 42 Communication B-code parameter configuration

#### PPS

Configuration Options: PPS/IRIG-B/PPM/PPH/TOD

Default Configuration: PPS

Function: Configure the signal output type of the COM channel output

#### Second Offset

Configuration Options: -999999999-9999999999(s)

Default Configuration: 0

Function: Configure the current output channel's second-level time offset. PPS signals do not support second offset.

## **PPS Offset**

Configuration Options: -250000000~25000000(ns)

Default Configuration: 0

Function: Configure the current output channel's nanosecond-level time offset. TOD serial signals do not support nanosecond offset.

## **Time Format**

Configuration Options: UTC / TAI / Local

Default Configuration: UTC

Function: Configure the time base of the current output channel, which can be selected as UTC/TAI/local time.

## **Information Format**

Configuration Options: NMEA-RMC/NMEA-ZDA

Default Configuration: NMEA-RMC

Function: Configure the signal format of the TOD serial code of the current output channel.

#### **Baud Rate**

Configuration Options: 1200/2400/4800/9600/19200/38400/76800/115200

Default Configuration: 1200

Function: Configure the communication baud rate of the TOD serial code of the current output channel.

#### **Output Signal**

Configuration Options: PPS/IRIG-B/PPM/PPH

Default Configuration: IRIG-B

Function: Configure the signal output type of the BNC channels.

#### **IRIG-B Mode**

Configuration Options: Odd Parity/Even Parity

Default Configuration: Odd Parity

Function: Configure the IRIG-B parity bit of the current output channel.

## **IRIG-B** Time Format

Configuration Options: UTC / TAI / Local

Default Configuration: Local

Function: Configure the reference time used by the IRIG-B time of the current output channel.

## **IRIG-B** Polarity

Configuration Options: Normal/Inverted

Default Configuration: Normal

Function: Configure the polarity of the IRIG-B signal of the current output channel.

AC

Configuration options:

IRIG-B1-AC output peak to peak (3.0V, 3.5V... 115V, 12.0V)

IRIG-B1-AC output modulation ratio (3.0:1, 3.5:1... 5.5:1, 6.0:1)

Default configuration:

IRIG-B1-AC output peak to peak (12.0V)

IRIG-B1-AC output modulation ratio (3.0:1)

Function: When configuring AC B code output on the device, it is used to adjust the peak to peak value and modulation ratio of the output signal.

## 5.5.3 Typical Configuration Example

To configure the clock product to output IRIG-B code signals, you can follow the following

three steps:

The first step is to switch the output channel to BNC

KYLAND					
	Path: Her	me >> Clock Server >> Output Co	onfig		
+Network	Output Co	onlig			
Application Clock Server	Output Ch	annel: BNC	~		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Output Signal	IRIG-B	*	
NTP Config	2	Second Compensation	0		-999999999-99999999(s)
PTP Config	3	PPS Compensation	0		-250000000-250000000(na)
Output Config	4	IRIG-8 Mode	Odd	~	
SNMP Manager	5	IRIG-B Time Format	UTC	•	
Source Status	6	IRIG-8 Polarity		*	
Clock Status	Acoly				
HUser	10000				
+System					

Figure 43 Selecting the Output Channel

The second step is to select the output signal as IRIG-B.

KYLAND					
11	Path: Hor	ne >> Clock Server >> Output C	onfig		
+Network	Output Co	infia			
+Application Clock Server	Output Cha	atmel: BNC	*		
Clock Sync Config	Index	Name	Parameters		Range
Clock Config	1	Output Signal	IRIG-B	~	
NTP Config	2	Second Compensation	0		-909999999-999999999(s)
PTP Config	3	PPS Compensation	0		-250000000-250000000(ns)
* Output Config	4	IRIG-8 Mode	Odd	~	
SNMP Manager	5	RIG-B Time Format	UTC	*	
Source Status	6	RIG-8 Polarity	•	*	
Clock Status	Annh				
+User	(obbid.)				
+System					

## Figure 44 Selection output signal

Third, IRIG-B mode is selected as odd check

KYLAND					
	D Path: Hon	ve >> Clock Server >> Output	Config		
+Network	Output Co	nfa			
+Application Clock Server	Output Cha	nnel: BNC	×		
Clock Sync Config	Index	Name	Paramete	13	Range
Clock Config	1	Output Signal	IRIG-B	*	
NTP Config	2	Second Compensation	0		-9099999999-999999999(s)
PTP Config	3	PPS Compensation	0		-250000000-250000000(ms)
Output Config	4	IRIG-8 Mode	Odd	~	
SNMP Manager	5	RIG-8 Time Format	UTC	*	
Source Status	6	RIG-8 Polarity		¥	
Clock Status	Acolu				
+User	opport				
+System					



The fourth step is to select IRIG-B time format as local

hyland	Path: Hor Output Co	ne >> Clock Server >> Ou	tput Config			
Clock Server	Output Cha	nnel: BNC	۷			
Clock Sync Config	Index	Name		Parameters		Range
Clock Config	1	Output Signal		IR/G-B		
NTP Config	2	Second Compensation		9		-9999999999~99999999(s)
PTP Config	3	PPS Compensation		0	1	-250000000-250000000(mi)
Output Config	4	IRIG-8 Mode		Odd	~	
SNMP Manager	5	IRIG-B Time Format		Local	~	
Source Status	ő	IRIG-8 Polarity		+	¥	
Clock Status	Annh					
User	(white)					
System						

Figure 46 Selecting IRIG-B Time Format

The fifth step is to select the IRIG-B polarity as normal

KYLAND					
+Network	Output Co	ne >> Clock Server >> Output (	Config		
+Application	Output Chu	enel: BNC	~		
-Clock Server	output ett	and a			
Clock Sync Config	index	Name	Parameters	1	Range
Clock Config	1	Output Signal	IRIG-B	*	
NTP Config	2	Second Compensation	0		-999999999 ~ 99999999 (t)
PTP Config	3	PPS Compensation	0		-250000000-250000000(mi)
Output Config	4	IRIG-8 Mode	Odd	~	
SNMP Manager	5	IRIG-B Time Format	Local	~	
Source Status	ő	IRIG-8 Polarity		. ¥	
Clock Status	Anoby				
+User	(obba)				
+System					

#### Figure 47 Selecting IRIG-B Polarity

At this time, the clock BNC Test Instrument port output signal is B code, the offset value is 0, the check format is odd check, and the polarity is normal.



## Note:

 $\triangleright$ 

When the configured clock time zone or summer time takes effect, the local time output by B code is UTC plus the set clock time zone or summer time deviation, and the clock time zone or summer time deviation is not added when outputting UTC or TAI time format.

# **5.6 SNMP Management**

## 5.6.1 Introduction

SNMP (Simple Network Management Protocol) is a set of network management protocols defined by the Internet Engineering Task Force (IETF).

SNMP has three working modes, SNMP provides GET operation to obtain data from devices; SNMP provides SET operations to perform some settings to the device; SNMP also provides Trap operation, which is mainly used to send notifications to administrators when some important failures or changes occur in devices. This function is commonly referred to as SNMP traps.

## 5.6.2 Web Page Configuration

Click the "SNMP Management" menu in the left navigation bar of the page, and the SNMP parameter information will be displayed in the interface, as shown in Figure 48:

KYLAND	1									
+Network	D Fatts Human	D Fafty: Huma >> Clark Server >> SNMP Manager SNMP Manager								
<ul> <li>Application</li> <li>Clock Sermi</li> </ul>	Didd Agent	Part	161		Trap Port:	(162				
Clock Syne Config	V1/V2C	+ADD -Del								
Clock Config	bades.		Community			Access		Operate		
NTP Config PTP Config	Trap	4400 =0el								
Output Config	and an	A MARKAGE MARK	Community/Last	Deat. IP	AstryTimes	Terenal	Drable	Operate		
* SNIVP Manager Source Status Clock Status	Ant									
+Uner +System										

Figure 48 Configuring SNMP Parameters

SNMP management supports modifying proxy ports, Trap ports, and adding or removing

	D Path: Hume >> Clock Server >> 5	NMP Manager						
*Network	DVMP Manager							
+ Application Clock Server	SAMP Agent Part.	161		Trap Port	(162			
Elock Sync Config	v1/v3c +ADD -Der	]						
Clock Config	andrea Communi	-89		Acres				Operate
NTP Config	245	1		RO	*			82
#T# Config	Tes 4100 2 m Del	1						
Output Config	14700 04				and the state of t	1000	_	Conv.
SNMP Manager	Index. Version	Communitylian	Dect.1P	RetryTimes	Timeted	Engine		Operate
Source Status	1 (V1/930			1.0	1	Enabled		10

Figure 49 Configuring Access Parameters

#### **SNMP Proxy Port**

V1/V2C access parameters

Configuration Options: Integers in the range 1-65535

Default Configuration: 161

Function: Port 161 is the standard port enabled by SNMP agent. The agent listens on this port to receive requests, such as Get and Set requests, as well as sending responses such as SNMP monitor settings and getting monitoring information.

#### **Trap port**

Configuration Options: Integers in the range 1-65535

Default Configuration: 162

Features: Port 162 is the standard port on which the SNMP agent accepts attached trap messages. A trap message is a special type of SNMP message that notifies the agent to the manager when a specific event occurs.

#### Community

Configuration options: Non-special characters

Default configuration: None

Function: This parameter determines the read-write permissions of the SNMP management data for users, with RO representing read-only and RW representing read-write.

## **Access Rights**

Configuration Options: RO/RW

Default Configuration: RO

Function: This parameter determines the read-write permissions of SNMP management data for

users. RO stands for read-only, and RW stands for read-write.

#### **Trap Community/User**

Configuration Options: Existing community users

Default Configuration: None

Function: This parameter determines whether the user of SNMP management data receives Trap information.

## **Trap Destination IP Address**

Configuration Options: Standard IP format

Default Configuration: None

Function: This parameter is the IP address of the user of SNMP management data to receive

Trap information (usually the PC's IP needs to be in the same subnet as the clock device's IP).



# Note:

When configuring IP parameters for the PTS-DR200L, they must adhere to the following format: The IP address must be a valid IP address separated by dots ('x. y. z. w'),

1) x, y, z, and w must be decimal numbers between 0 and 255,

2) x cannot be 0,

- 3) x cannot be 127,
- 4) x cannot be greater than 223,
- 5) w cannot be 0 or 255.

## **Trap Retransmission Times**

Configuration Options: 1~10

Default Configuration: 5

Function: The number of times a Trap message is retransmitted if the initial send fails.

#### **Trap Timeout**

Configuration Options: 1~10

Default Configuration: 3

Function: The timeout period for sending a Trap message.

## **Trap Enable**

Configuration Options: Enabled/Disabled

Default Configuration: Enabled

Function: To enable or disable the Trap function.

# 5.6.3 Typical Configuration Example

1.When using SNMP's GET and SET operations to manage the clock server, you can configure it in the following three steps:

The first step is to use the default proxy port 161, add the community user name of SNMP, and select the community

KYLAND							
+Herberch +Application	D Path; Huma 3.3 Chuk Savar DMP Manager	>> DMP Manager		True Bank		-	
-thui Server	Solar Agent Fort	1991		The Port	194		
Clock Sync Config	VU/V2C +A00 +	- Der					
Clock Config	Index CO	and the second se		Ac1210			Operate
NTP Config	1 24	tik:		RW	*		10
#T# Config Output Config	Trep +400 -	-Del					
* SMMP Manager	todex Version	Common Ry Mast	Dect. IP	RetryTimes	Treest	Deable	Operate
Source Status							
Clock Status	[ And ]						
+User	1460						
4 System							



The second step, using the MIB Browser tool, configure the clock server network port IP, configure the SNMP proxy port, community name, SNMP version.

CAD M M M M M M M M M M M M M M M M M M M		
SNMP MIDS		Result Table
iso.org.dod.internet.private.et 🚳 Adv	vanced Properties of SNMP Agent	×
digigridAgent     digigridProducts	Address 192.168.0.111	
🕀 🧧 digigridTraps	Port 161	
Read	d Community public	
Wnit	e Community public	
SN	MP Version 2	~

Figure 51 MIB Browser Tool Parameters

The third step, GET operation can be carried out on the function module of the clock server on the MIB Browser tool to obtain the configuration information of the specified object of the clock server, which is consistent with the configuration of the web interface parameters and changes in real time with the modification of the web interface parameters; The SET operation sets the configuration information of the specified object of the clock server, and after the setting is issued, the web interface can be viewed to synchronize this modification;

Address 1942 049 8 311	Advant.	000-118141-099431	1118			- Operations End Newl		Aller .
STORP HERe			Receit Table					
Mill Tex	1.1.4.1.4.4.4.4		NewSort		Vite	1 Dec.	1 Index	In
0 😳 ini ing disklaterast pitisati satis	and the state of the state of	k2010	Contraction (Contract)			Contractor -	1001 here in 111 a	- 2
· Appelitant			and the state of t				THE DESIGNATION OF	10
AppleTrubett			in the delivery of			han an	1011 101 11111	0
the life game			And the second state of the second state				041 044 0 111 1	10
6-10 ptp			the free start speed 1			here .	042 346 6 111 1	12
			on how of all Points 1				141 141 1111	
to 20 com/Sumpt			and from the Unit over 1	î		heree	041 244 0 1111	
the local standing on the			tran Samerhigh (Mullime 1)	1		hanger	042 048 8 311 5	
and the state of t	C The lands		insufaces of Pachal Type 8	1		later.	102100-0111-0	
a summittee	Rented to	10 C	non-farmer Konchilade B			langer .	142 146.0 1111	21
a exclusional		28	conclusion of Parlianty 0			herpe	142 148 0 111 1	3
a contraportation	Capacity 12	•	ton from shiph (Private 8			hanger .	101 101 1111	21
of the board opposite	Expend of the							
at the base shares	Changelle Martin	Child .						
a contraction	- Car	Children						
of the loss reader	Contract In	1000						
2 million and								
(2 inclusion)	Con Ball	Caro						
1. Providence in the	Linkson.	OH5						
- 1 mm	54	CMF5						
· management and	7.6	0.64-9						
of the second land	Take Name	Chart .						
and the second								
In the automatic								
In C. Astron Trape								
No.			14					
00 1141414549111								
Alla Decision and Alla International		5.649						
Southern Investment of the								
Annua mad name								
finature								
Defia								
Indiana .								



Addrew 1401003.003 - 8.0	ment (SD 114141419111110		- 0	pennes Geller - #G	1
ENDP MIN-		Barat Table			
♥ ADD Tool		Nam (30) recharche/Posti 1 recommination (34) ye 1 ion han chef 201 ye 1	Vile	Tape         IPPur           Image         170,181         Image           Image         170,181         Image           Image         120,181         Image           Image         200,182         Image           Image         200,183         Image           Image         200,183         Image           Image         200,183         Image           Image         200,183         Image           Image         201,183         Image	
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technisticory     technis	(%) (%)				

Figure 53 SET Operation

2.When using SNMP user to receive clock server Trap information, continue to configure in 2 steps on the premise that the community user has been created above:

The first step is to add a new Trap user, which must be an existing community user and the destination IP address is receiving SNMP Trap IP of PC network port of information, and other parameters default;

n/LAID								
6 horses	D Path: Home >> Clack Server >> Sh	WP Manager						
+ Network	DVMP Manager							
Application     Clock Server	SNMP Agent Port	161	- 1	Trap Port.	162			
Clock Sync Config	vuvac +400 -0e							
Clock Config	Contract Contractor			Alexan				Deservice
NT# Config	1 public			RW	*			#0
#T# Config Output Config	Trap +400 =Del							
SMMP Manager	Audus Version	Community/User	Bert. #	RetryTores	Timenut	Example	1.000	Operate
Source Status	1 (V1600 41	public	192,168.8.11	5	1 1	Enabled		-
Clock Status	Ann							
+Unit +Sectors	State of the second sec							

Figure 54 New Trap User

The second step is to configure Trap Port in Tools-> Trap Receiver using the MIB Browser tool, and click Start Button waiting for the clock server status changes, in this interface can get the reported Trap information;

Abox 192.00.0.111 - Advaced. QD 114.141	45454.2.1.1			- Operations Gel -
TMP MEM	Trop Reveloer			
+ 12 km	T Constant Tank			
+ 12 machiner	O O R O A			
+ tearChok	O V EI V M			177-7
+ Compatibility of the second	Designa	hours	Taur	544
+ artrak	Supriso Chris/LidState	342 188 0 111	2023-09-29 19:20:20	
- datestifteen	traption ClockSelectioners	1092 100 0 111	2023-10-29 10:20:29	
- (a. pro	(any one for an of Contenty field)	1002 1888-0.1111	2023-00-27 10:20:01	
1 Sections	Improve Source/NetTrackedStat1	1992 168 0 3111	2023-09-25 10:2015	
- nonlawa	(traps you find any school search final in	148 198 0 111	2021-00-27 10:20:34	
- C states	property to the or the second se	1042 1880 0.011	2023-00-27 18 28 13	
the Contraction of the Contract	Ingrise Caralitations	2002 2000 2111	2023-09-29 10:20:30	
- F proceedings of the bad	Ingrise ClockSelectioners	1092 1495 0 111	2023-10-24 10:20-08	
B traces (here of the light)	proprior factors New Tracks (New Y	1082 1488-0.1111	2023-08-27 88:20-06	
Statement and the second second	(http://www.forecofContinuity/Http:/	192 108 0 111	2023-10-2510-2019	
S have a free of the other from the T	proprom/Source/NeutTracker/Biat1	1992 1898-0 571	2023-10-27 10:20-07	
A second secology (New Texts Section)	(angoing foreign future a fast sea fast of fast 1	1092 18810-0111	2023 10-24 10 20 01	
A Amount Concelling to Start	Improve Support States State	2002 2008 0 211	2023-09-27 1929-04	
A second an above back	Improve Support Number Condition (	1092 146-0 1011	2023-30-24 83 09-44	
A successful and the state for	Jungsone Transver Naud Transland Tradit	1002 140-0 101	2023-00-27 10 19-42	
S have been Control from	Impired Check/Lindform	192 148 0 111	2023-00-25 10:09:25	
A Report of the Article Arts	Implan Click Scienting ra	042188-0.011	2021-00-28 10:09:24	
A second and Casher Pro-	Ingite-Ch-Mildings	2002 10030 121	2023 00-24 10 09-99	
and the second sec	Inspired Brickheiterformere	2002 2003 0 2111	2023-09-24 10.0908	
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a second contraction of the				
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A handle Ch. all all all				
A REAL PROPERTY OF A				
P hapterChildren Than				
· togethere and				

Figure 55 Trap Receiver Interface

## **5.7** Synchronization Source State

## 5.7.1 Introduction

Synchronizing source status displays the working status of the time input source supported by the device.

Select different time source channel management interface will display the current status information of different time sources. For example, when SAT is selected, state information such as time source state, number of satellites, antenna state, time continuity state and source priority can be seen. "Normal" means that this status is good. If there is a problem, an "abnormal" alarm message will be displayed at the relevant position.

## 5.7.2 Web Page Configuration

Click the "Synchronization Source Status" menu in the left navigation bar of the page, and the synchronization source status information will be displayed in the interface:

Path: Home >> (	Clock Server >> Source Status		
Source Status			
Source Channel:	SAT 🗸		
Index	Name	Status	
1	Source Status	Normal	
2	Satellite Number	18	
3	Antenna Status	Normal	
4	Source Bump Status	Normal	
5	Source Priority	4	
Duturb			
Retresh			
	Path: Home >> ( Source Status Source Channel: I 2 3 4 5 Refresh	Path: Home >> Clock Server >> Source Status Source Status Source Channel: SAT  Index Name I Source Status S Source Status S Source Status S Source Rump Status S Source Priority Refresh	Path: Home >> Clock Server >> Source Status         Source Status         Source Channel:       SAT         Index       Name         Source Status       Normal         2       Satelite Number         3       Antenna Status         4       Source Bump Status         5       Source Priority

# Figure 56 SAT Synchronization Source Status

KYLAND				
+Network	Path: Home >> (	Clock Server >> Source Status		
+Application Clock Server	Source Channel:	IRIG-8		
Clock Sync Config	Index	Name	Status	18
Clock Config	1	Source Status	Alarm	
NTP Config	2	Source Bump Status	Alarm	
PTP Config	1	Source Priority	3	
Output Config SNMP Manager	Refresh			
* Source Status				
Clock Status				
+User				
+System				

Figure 57 IRIG-B Sync Source Status

KYLAND				
+Network	Path: Home >>  Source Status	Clock Server >> Source Status		
+Application Clock Server	Source Channels	(PTP •		
Clock Sync Config	Index	Name	Status	
Clock Config	1	Source Status	Normal	
NTP Config	2	Source Bump Status	Normal	
PTP Config	3	Source Priority	1	
Output Config	[ Patrick ]			
SNMP Manager	Premesh			
* Source Status				
Clock Status				
+User				
+System				



#### **Clock Source Status**

Status Information: Normal/Abnormal

Function: "Normal" indicates that the synchronization source is valid, and "Abnormal" indicates that the synchronization source is invalid.

#### **Number of Satellites**

Status Information: 0~255

Function: Displays the number of satellites found by the SAT channel.

#### Antenna Status

Status Information: Normal/Abnormal

Function: Indicates the status of the antenna.

#### **Time Continuity Status**

Status Information: Normal/Abnormal

Function: "Normal" indicates that the time information from the synchronization source is continuous, and "Abnormal" indicates that the time information from the synchronization source is not continuous.

#### **Source Priority**

Status Information: 1~10

Function: Shows the priority level of the source.



## Note:

⊳

The external synchronization sources supported by PTS-DR200L are SAT, IRIG-B and PTP. When the source channel is switched to IRIG-B, PTP, the synchronization source status parameters no longer show the number of satellites and antenna status.

## 5.8 Clock State

## **5.8.1** Introduction

The clock status displays the external time source selected by the current device, along with the device's crystal oscillator taming status, punctuality status, power status, frequency, position information and software version information of the current device.

## **5.8.2** Web Page Configuration

Click the "Clock Status" menu in the navigation bar on the left side of the page, and the clock status information will be displayed in the interface, as shown in Figure 59:

KYLAND				
	Path: Home >	> Clock Server >> Clock Status		
+Network	Clock Status			
+Application				
-Clock Server	Index	Name	Status	
Clock Sync Config	1	Selected Source	SAT	
Clock Config	2	Initial Status	Initialized	
NTP Confin	1	Hold Status	Tracking	
ATP Config	4	Power Status	Normal	
PTP Conng	5	Frequency	124999989	
Output Config	6	Longitude	111 202624	
SNMP Manager	7	Latitude	30 6846784	
Source Status	8	Height	96	
Clock Status	0	Version	0x0203	
+User				
+System	Refresh			

Figure 59 Clock status information

## **Current Synchronization Source**

Status Information: SAT /IRIG-B/PTP/Local

Function: Displays the current external time source selected by the device.

## **Initialization Status**

Status Information: Initialization Not Complete/Initialization Complete

Function: Shows the status of initialization.

## **Keep Time Status**

Status Information: Tracking/Keep Time

Function: "Tracking" indicates that the device is locked to an external time source, and "Keep Time" indicates that no valid external time source device is present, and the device is using its internal time source.

## **Power Status**

Status Information: Normal/Abnormal

Function: Displays the status of the power supply operation.

## Frequency

Function: Displays the frequency of the crystal oscillator.

## Longitude

Function: Displays the longitude information of the device.

## Latitude

Function: Displays the latitude information of the device.

## Altitude

Function: Displays the altitude information of the device.

#### Version

Function: Displays the FPGA version information of the device.



# Note:

⊳

The current synchronization source status information supported by PTS-DR200L includes SAT, IRIG-B, PTP and local. When the satellite source is normal, the current synchronization source is SAT or other modes, and the longitude, dimension and height information display the real-time position information of the device; When the satellite source is abnormal, the display of device position information is not supported, and the longitude, dimension and altitude information are all 0.

# **6** Users

## 6.1 User management

#### 6.1.1 Introduction

In order to solve the security risks caused by illegal users accessing the device, the device provides user hierarchical management function, which formulates different permissions based on different user identities to meet the diversified needs of user authority control.

#### 6.1.2 Web Page Configuration

1. Create a new user, as shown in Figure 60:

KYLAND					
	D Path: H	ome >> User >> User Mana	gement		
+Network	User Ma	nagement			
+Application	-				
+Clock Server	Index	User Name	Parsarord	User Level	Operation
-Uan	1	testuser1		Read/Write V	081
* User Management	2	testuser2	*****	Read 🗸	O RICI
Modify Password					
+System					

Figure 60 Creating A New User

Click 2 < Add > button in the user name edit bar to add a new user, enter the user name and password, configure different user levels, and create up to 10 users. Enter the correct user name and password and click the 2 < Confirm > button to complete the addition.

#### User name

Configuration range:  $1 \sim 31$  characters

Function: Configure user name.

#### Password

Configuration range:  $8 \sim 31$  characters

Function: Configure user login password.

#### **Authority level**

Configuration range: read-write, read-only

Function: Configure the permission level of this user. Read-write users can modify various configurations of web pages, read-only Users can only view the configuration and cannot modify it.

2. Modify the user configuration, as shown in Figure 61;



KYLAND					
	Path: H	iome >> User >> User Mana	gement		
+Network	User Ma	magement			
+ Application					
+Clock Server	Index	User Name	Pessword	Oser Level	Operation
-Horr	1	testusert		Read/Write ¥	011
These Management	2	Destureer2	*****	Read 🛩	0:1
User management	_			Read	
Modify Password				Read/Write	
+ System					

Figure 61 Modifying User Configuration

Users only support changing passwords and permission levels. After entering the latest

information, click the  $\bigcirc$  < Confirm > button to complete the modification. Click the  $\bowtie$  < Delete > button to delete the user.



# Note:

The default user admin cannot be deleted.

Only admin users have user management page permissions, and other users only have password modification page permissions

# 6.2 Change Password

 $\triangleright$ 

Modify the login password of the current user, as shown in Figure 62;

KYLAND		
	Path: Home >> User >> M	odify Password
+Network	Modify Password	
+Application		
+Clock Server	User Name	admin
-User	Current Password	Current Password
User Management	New Password	New Password
Modify Password	Confirm New Password	Confirm New Password
+System	Apply	

Figure 62 Login Password Modification

## **Current password**

Configuration range:  $8 \sim 31$  characters

Function: Confirm the identity of the current user and avoid the password being tampered with by others.

#### New password

Configuration range: 8 ~ 31 characters, lowercase letters, uppercase letters, numbers, special

characters, meet one, strength +1, below strength 3 will prompt "password strength is low, do you want to continue?" (Please use the combination of uppercase and lowercase letters, numbers and special characters for passwords). The minimum length of passwords is 5 digits, and special characters can only be!  $(@, #, \$, \%, \land, \&, *, (.))$ 

Function: Configure the new password to be modified.

## New password confirmation

Configuration range:  $8 \sim 31$  characters

Function: Confirm the new password that needs to be modified, so as to avoid the incorrect entry of the new password and the inability to log in.

#### Cryptographic strength

Display range: red, orange, green

Function: Display the strength of the current new password. Red represents the weak strength of the password and is very easy to be cracked; Orange + orange means that the password strength is average and easy to be cracked; Red + orange + green means that the password is strong and not easy to be cracked.



# Note:

After receiving the device, it is recommended that the customer configure a strong password according to their own needs to avoid losses caused by the device password being cracked by others.

# 7 System

# 7.1 Log

The system log page is used to record the running information of device, and can download the log, which is convenient for daily maintenance and fault detection of device.

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	Apriles Log ( Standing Defined )		
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	[44] J. W. (1997) "The Works, C. H. W. (1998) In Proc. Phys. Rev. B 10, 111 (1997) [1019].		
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	apr 2 di 2012 PT-00000 1121 W meen-retire celles celles transform Tann' has 12m menenticity		
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#### Figure 63 System Log Page

Log settings are used to send log information to specified external servers, and can be used to remotely monitor device operation information.

KYLAND						
	Path: Home					
+Network	System Log	Logging Settings				
+ Application		N CARLON AND	-			
+Clock Server	Eni	Enable Log Client				
+User	External	External System Log Server		J		
-System	External System Log Server Port		514			
Log	External Syst	tem Log Server Protocol	UDP			
Backup/Restory	Apply					
Upgrade						
Reset						
Reboot						

Figure 64 Log Setup page

## **Enable Log Client**
# KYLAND

Configuration Option: Enable/Disable

Default Configuration: Disable

Function: Enables the log client feature

#### **External Log Server**

Configuration Range: A.B.C.D, valid IP address

Function: As a Client, fill in the IP address of the log server with which the device communicates

#### **External Log Server Port**

Configuration Range: 1~65535

Function: As a Client, fill in the port of the log server with which the device communicates

#### **External Log Server Protocol**

Configuration Range: UDP

Function: The device's log feature only supports communication with a UDP protocol server.

## 7.2 Backup/Restore

The Backup Recovery page allows you to backup and upload configurations.

Click < Generate Backup > to download the current configuration file and archive it locally. Click < Browse > button, select the local configuration file path, click < Upload Backup > to import the local configuration file, and use the local configuration file to restore the device configuration information.

KYLAND			
	Path: Home >> System >> Backup	Restory	
+Network	Backup/Restory		
+Application		a tea a la fair a dal a constant a sulla sulla della	
+Clock Server	Citik Generalia Archiver to download	a tige and that of the current contiguration tree.	12.2
+User	Download Backup Generate		Generate Archive
-System	To restore configuration files, you can	undered a considerable memorated backure weblaw been	
Log			
Backup/Restory	Reset To Backup	Choose File No file chosen	Upload Archive
Upgrade			
Reset			
Reboot			

#### Figure 65 Backup Recovery Page



#### Note:

When restoring to the backup settings, the file device used will be verified, and if the device host name is inconsistent, recovery is not allowed.

#### 7.3 Upgrade

The device can achieve better performance through software version upgrades. The upgrade for this series of devices includes KERNEL version upgrades and ROOTFS software version upgrades. When upgrading, the KERNEL version should be upgraded first, followed by the ROOTFS software version. It is possible to only upgrade the ROOTFS software version if the KERNEL version remains unchanged. Upgrades can be completed through the web interface.

KYLAND			
+Network +Application +Clock Server	Path: Home >> System >> Upgrade Upgrade Flash new firmware image Uplead a spectroprode compatible image here to replace the scening firmware. Over "Xeep certings" to retain the		
-System	Keep Settings		
Log Backup/Restory	Intege	Choose Files No file chosen	Flash Image
* Upgrade			
Reset			
Reboot			

Figure 66 Software Upgrade Page

Click the < Select File > button, select the upgrade file path, and then click the < Upgrade > button to upgrade the web firmware. After the upgrade is successful, the gateway device will restart automatically and the system will be updated successfully.

Check the < Keep Configuration > button, and the configuration will be kept after upgrading. If < Keep Configuration > is not checked, the configuration will not be kept after upgrading, and the configuration information will be restored to the factory default configuration state.

# Note:

The upgrade process will stop related business programs. If the upgrade fails and the related business still needs to be used, the machine will need to be restarted during software upgrades, the device's power and network should be kept running normally to avoid upgrade failure.

# 7.4 System Reset

The System Reset page is used to restore this device to the factory setting state.

When you need to clear all the configuration information on the device, click the < Reset > button to restore the device to the factory default settings.

# KYLAND

KYLAND		
+Network	Path: Home >> System >> Reset Reset	
+Application		protection of the second se
+Clock Server	Reset To Delauh	Perform Reset
+Usrr		
-System		
Log		
Backup/Restory		
Upgrade		
Reset		
Reboot		





#### Warning:

Restoring factory settings will completely reset the device, and the device configuration parameters will be restored to the factory default configuration state. Please operate carefully.

## 7.5 Restart

The Restart page is used to restart this device.

When you need to restart the device, you can click the < Execute Restart > button to restart the device

KYLAND			
	Path: Home >> System >> Reboot		
+Network	Reboat		
+Application			
+Clock Server	Reboot the operating system of your device		
+User	Perform Reboot		
System			
Log			
Backup/Restory			
Upgrade			
Reset			
Reboot			

Figure 68 System Restart Page

# 8 OLED display screen

#### 8.1 Interface structure

PTS-DR200L provides an OLED display screen to display the current status information of the device. There are five interfaces to display various types of information, namely the benchmark time information interface, firmware compilation time information interface, software version information

## KYLAND

interface, hardware version information interface, synchronization source and clock status

information interface



## Note:

PTS-DR200L provides two buttons to switch the display interface.

Left: Switch display interface to the left

Right: Switch display interface to the right

# 8.2 Reference time information interface

The system benchmark time display format is Time + YYYY-MM-DD + HH: MM: SS. As shown in the following figure



Figure 69 System benchmark time display interface

The summer time information is displayed after the time information with an "\*" symbol. As shown in the following figure



Figure 70 System benchmark time display interface (summer time)

# 8.3 Firmware Compilation Time Information Interface

Query the version information of the current software and display the firmware compilation time of the current version.

The display format is APP+YYYY-MM-DD+HH: MM: SS. As shown in the following figure



Figure 71 Firmware Compilation Time Display Interface

# 8.4 Software version information interface

Query the current software version information and display the current version number.

The display format is SW Ver + "version number". As shown in the following figure

# SW Ver R0001 0.0.0.2

Figure 72 Software Version Display Interface

# 8.5 Hardware version information interface

Query the hardware version information of the current device and display the current hardware version number.

The display format is HW Ver + "version number". As shown in the following figure



Figure 73 Hardware Version Display Interface

# 8.6 Synchronization source and clock status information interface

# 8.6.1 Synchronize source status information

As a sync time source, GPS displays in the following format:

GPS [Clock Status]

XX/XX

- XX (1st) Number of GPS satellites currently locked
- XX (2nd) GPS antenna status. It can be any of the following:

OK: The antenna is normal

NO: Antenna abnormality



Figure 74 Synchronization source status: GPS

As a sync time source, BDS displays in the following format:

BDS [Clock Status]

XX/XX

- XX (1st) Number of BDS satellites currently locked
- XX (2nd) BDS antenna status. It can be any of the following:

OK: The antenna is normal

NO: Antenna abnormality



Figure 75 Synchronization source status: BDS

As a sync time source, GLONASS displays in the following format:

GLN [Clock Status]

XX/XX

- XX (1st) Number of GLONASS satellites currently locked
- XX (2nd) GLONASS antenna status. It can be any of the following:

OK: The antenna is normal

NO: Antenna abnormality



Figure 76 Synchronization source status: GLONASS

As a sync time source, IRIG-B displays in the following format:

FI [Clock Status]

ΧХ

XX (1st)

IRIG-B : The input polarity format can be any of the following

- D+: Positive polarity
- D-: Negative polarity



Figure 77 Synchronization source status: IRIG-B

As a sync time source, PTP displays in the following format:

PTP [Clock Status]

XX XX

KYLAND			PTS-DR200L Rack Clock Server
XX (1st)	The PT	P working mod	e can be any of the following:
	S: Sla	ve clock	
	B: Bo	undary clock	
XX (2nd)	PTP de	lay measuremen	nt mode. It can be any of the following:
	E2E:	End to End	Delay Request - Request Response
	P2P:	Port to Port	Opposite latency
	Dis:	Disable	Prohibit delayed measurement
		PTP LO S E	OCK 2E

Figure 78 Synchronization source status: PTP Slave clock, E2E



Figure 79 Synchronization source status: PTP Boundary clock, Dis

#### Note:

When PTP is set to Master as the master clock, it cannot be used as the synchronization source.

# 8.6.2 Clock status information

For any time reference source, the last information on the first line displays the current working status of the clock. In the search state of synchronous lock mode, the text is displayed as SEEK, in the initialization state of synchronous lock mode, the text is displayed as INIT, in the tracking state of synchronous lock mode, the text is displayed as SYNC, in the locking state of synchronous lock mode, the text is displayed as RCVR, and in the punctuality process, the text is displayed as HOLD.



Figure 80 Synchronous Lock Mode (SEEK)



Figure 81 Synchronous Lock Mode (INIT)



Figure 82 Synchronous Lock Mode (SYNC)



Figure 83 Synchronous lock mode (LOCK)



Figure 85 Timekeeping mode (HOLD)