PTS-30
Time Server
Operation Manual
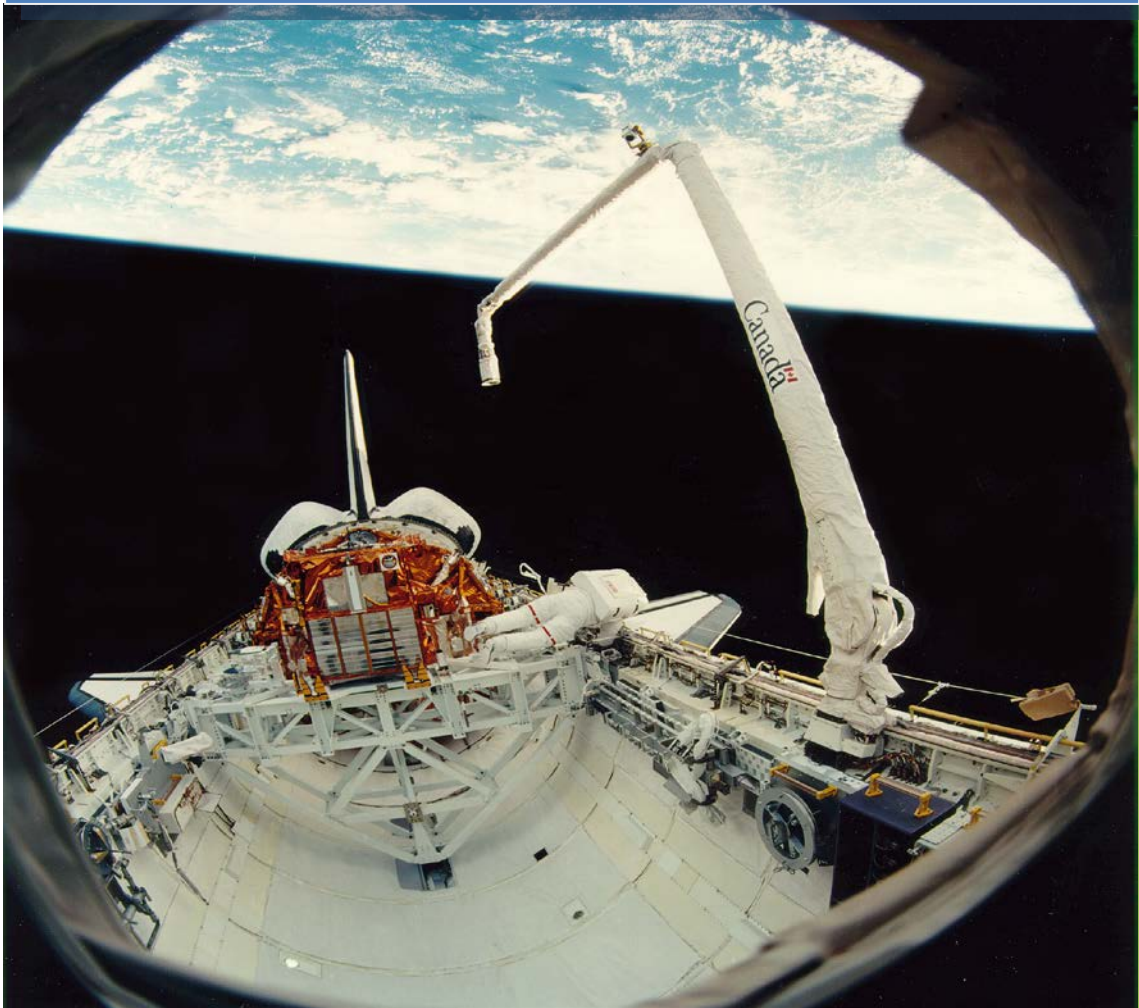
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Contents

1.   Basic Features
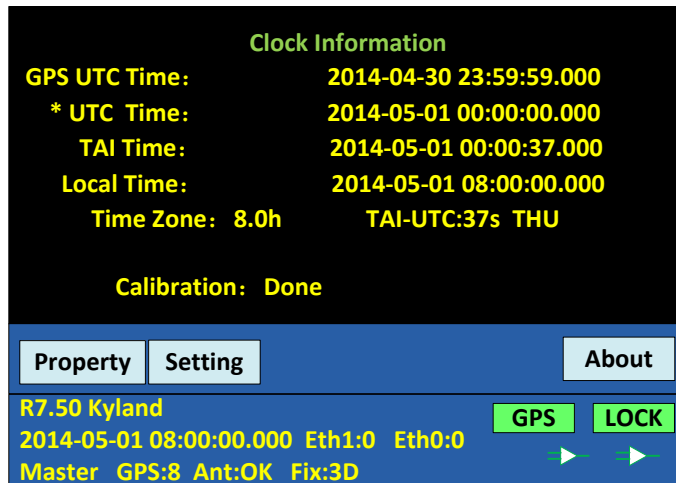
1.1. **Introduction**

[Figure1-1] PTS-30 Time Server

The PTS-30 time server is a standard time synchronization server. Support GPS, BDS, GLONASS, IRIG-B and PTP time source, internal built-in TCXO, OXCO, Rubidium Oscillator and multiple sources time sync automatic selection algorithm and Master/Slave clock redundant switch control   logical, which will perform GPS, BDS, GLONASS, IRIG-B, PTP and local clock System multiple time source auto selection, sky/grounding and master/slave clock backup. PTS-30 time server provides flexible time synchronization signal output slots which can help to configure different timing output interface channel. The output timing channels include PPS, PPM, PPH, IRIG-B (DC), IRIG-B (AC), Serial Time Signal (TOD etc.) etc. Both fiber and copper interfaces are supported. Plus, PTS-30 supports network sync time protocols NTP/SNTP/EEE1588 v2.0. IEEE1588 works in several modes by the software configuration including grandmaster clock, slave clock and boundary clock. PTS-30 time server also has alarm contact output. PTS-30 time server provides 5.7 inch color touch screen as HMI and the visualization interface is available for work status monitoring and parameters setting. Meanwhile, PTS-30 time server is designed to send timing source status and clock status to control center by IEC61850, IEC60870-5-104, IEC60870-5-101, DNP3.0, and Modbus etc. PTS-30 time server also supports WEB and SNMP to manage system.

2.   Touch Screen

2.1.   Main Screen

The default main screen is shown as below:

Clock Information
GPS UTC Time：	2014-04-30 23:59:59.000
* UTC Time：	2014-05-01 00:00:00.000
TAI Time：	2014-05-01 00:00:37.000
Local Time：	2014-05-01 08:00:00.000

Time Zone：8.0h   TAI-UTC:37s THU

Calibration：Done

| Property | Setting | | About |

R7.50 Kyland
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
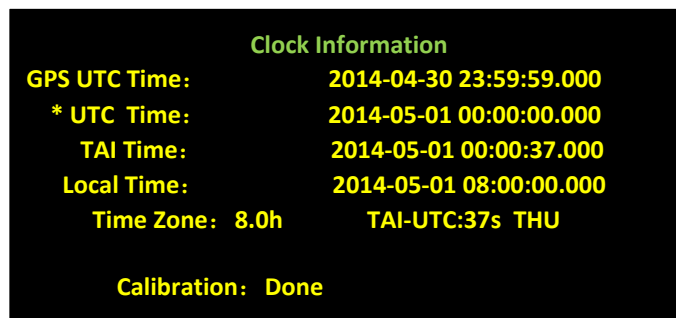Master   GPS:8 Ant:OK Fix:3D   GPS   LOCK

[Figure 2-1] PTS-30 Main Screen

The screen is made up of data area, function area and status area. Data area and function area have dynamic position information. Sometimes some screens only show data area, and sometimes some screens only show function area, and sometimes they all show together on one screen. But status area always is shown on the bottom of screen. The data area and function area lie on top of status area. If data area and function area show together, function area belongs to middle area.

2.1.1.   Data Area

According to different functions, various formats are used to display data on this area.

Clock Information
GPS UTC Time：	2014-04-30 23:59:59.000
* UTC Time：	2014-05-01 00:00:00.000
TAI Time：	2014-05-01 00:00:37.000
Local Time：	2014-05-01 08:00:00.000

Time Zone：8.0h   TAI-UTC:37s THU

Calibration：Done

[Figure 2-2]PTS-30Time Square

2.1.2.   **Status Area**

System clock, PTP mode, time sync source, time locking status, PTP activities for both ports and power supply status are shown on status area.

R7.50 Kyland		GPS	LOCK
2014-05-01 08:00:00.000 Eth1:0 Eth0:0		►	►
Master GPS:8 Ant:OK Fix:3D			

[Figure 2-3] PTS-30 Status Area

Note: According to different configuration parameters, status area displays information by various formats.
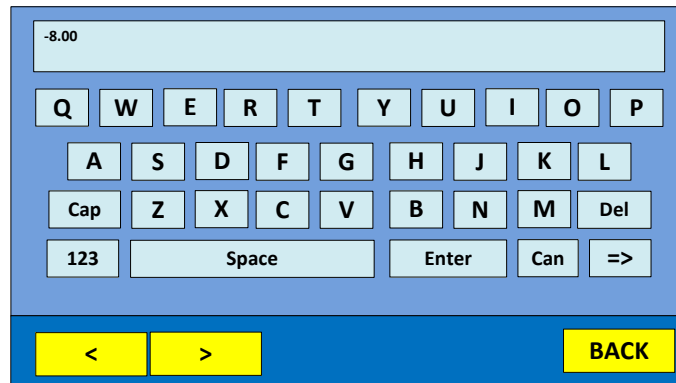
2.1.3.   **Function Area**

Press any button with finger or stylus pen calls that function on function area.

| Property | Setting | | About |

[Figure 2-4] PTS-30 Function Area

2.2.   **Screen Keyboard**

For some screens, such as settings modification, password, data input is needed. In such situation, a soft keyboard is displayed. Keyboard can be switched to 3 modes: numeric keyboard, ASCII keyboard and special character keyboard.

```
-8.00

Q  W  E  R  T  Y  U  I  O  P
 A  S  D  F  G  H  J  K  L
Cap  Z  X  C  V  B  N  M  Del
123      Space      Enter  Can  =>

<        >                    BACK
```
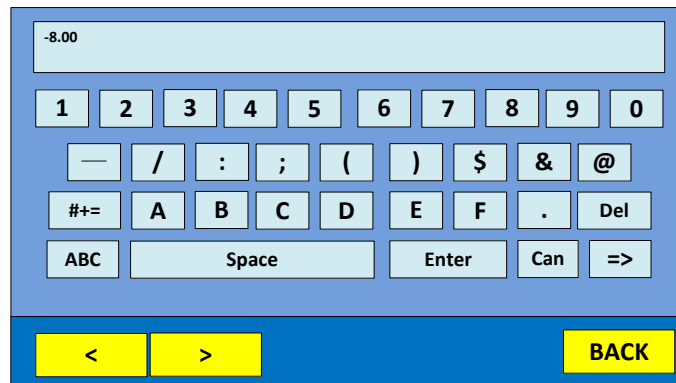
[Figure 2-5] ASCII Keypad

Press "Cap" key to switch upper case input mode and lower case input mode.

Press "123" key to switch numeric input mode.
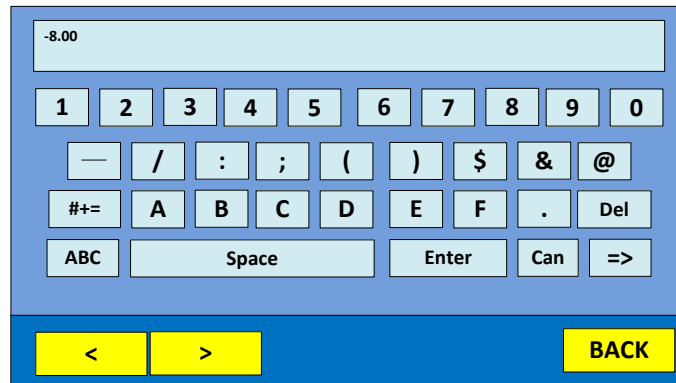
[Figure 2-6] Numeric Keypad

Press "#+=" key to switch special character input mode.

Press "ABC" key to return ASCII keyboard.

[Figure 2-7] Symbol Keypad

"Del": delete key; "Can": cancel key; "=>": copy key; "Enter": confirm key.

2.3. Status Indication

There are 3 lines status information to indicate system status on status area to show different information according to its functions.

2.3.1. Time Reference Status

The time reference status is shown at right area of the first line. PTS-30 uses two LEDs to indicate time reference status. According to different time reference, LEDs are used to show different color and text. The first LED shows time reference sources and the second LED shows time reference status.

For GPS time reference source, the first LED named GPS is shown below.

[Figure 2-8] Time Reference (GPS)

For BDS time reference source, the first LED named BDS is shown below.

[Figure 2-9] Time Reference (BDS)

For GLONASS time reference source, the first LED named GLN is shown below.

[Figure 2-9] Time Reference (GLONASS)

For IRIG-B time reference source, the first LED named IRIG is shown below.

[Figure 2-1] Time Reference (IRIG-B)

For PTP time reference source (i.e., the PTS-30 is working as PTP Slave Clock and Boundary Clock), the first LED is named PTP.

[Figure 2-2] Time Reference (PTP-Slave)
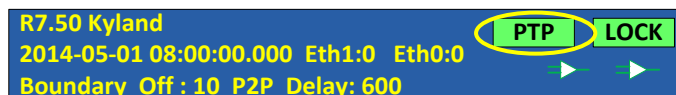
[Figure 2-3] Time Reference (PTP-Boundary)

For any kind of time reference source, the second LED always shows time synchronization mode. For seeking status, "SEEK" is displayed; for initial status, "INIT" is displayed; for sync status, "SYNC" is displayed; for lock status, "LOCK" is displayed;

for time adjust status, "RCRV" is displayed; for hold status, "HOLD" is displayed.

[Figure 2-4] Sync Lock Mode (SEEK)

[Figure 2-5] Sync Lock Mode (INIT)

[Figure 2-6] Sync Lock Mode (SYNC)

[Figure 2-7] Sync Lock Mode (LOCK)

[Figure 2-8] Time Setting Mode (RCVR)

[Figure 2-9] Hold Mode (HOLD)

2.3.2. System Reference Time

The system reference time is shown at left area of the second line.

The time format is YYYY-MM-DD HH:MM:SS.mmm.

[Figure 2-10] System Reference Time

2.3.3. PTP Activity Counters

The PTP activity counter is shown at right area of the second line. It shows PTP activity counter value of both Ethernet ports Eth0 and Eth1. These 2 counts are in range 0-999.

The meaning of the count is depended on PTP mode. The counter value of the whole ports on master clock or master clock port on boundary clock represents slave's delay measurement activities, including P2P and E2E delay measurement. The counter value of the whole ports on slave clock or slave clock port on boundary clock represents the number of received and processed PTP sync messages.
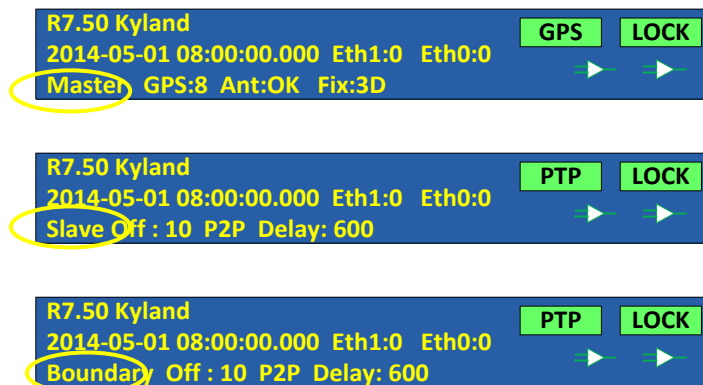
```
R7.50 Kyland                          GPS    LOCK
2014-05-01 08:00:00.000 Eth1:0  Eth0:0
Master  GPS:8  Ant:OK  Fix:3D
```

[Figure 2-20] PTP Activity Counter

2.3.4.   PTP Mode

The PTP mode is shown at left area of the third line. The PTS-30 might work in one of the following modes:

Master   PTP Grandmaster Clock
Slave   PTP Slave Clock
Boundary   PTP Boundary Clock

```
R7.50 Kyland                          GPS    LOCK
2014-05-01 08:00:00.000 Eth1:0  Eth0:0
Master  GPS:8  Ant:OK  Fix:3D
```

```
R7.50 Kyland                          PTP    LOCK
2014-05-01 08:00:00.000 Eth1:0  Eth0:0
Slave Off : 10  P2P  Delay: 600
```

```
R7.50 Kyland                          PTP    LOCK
2014-05-01 08:00:00.000 Eth1:0  Eth0:0
Boundary  Off : 10  P2P  Delay: 600
```

[Figure 2-21] PTP Mode

2.3.5.   Sync Source

The sync source is shown at left area of the third line. The display format depends on the sync source.

Use GPS as sync source, the display format is shown below:

GPS:xx   Ant:xx   Fix:xx
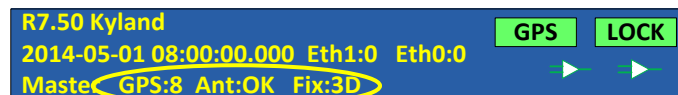GPS   The amount of locked GPS satellites at present.
Ant   GPS antenna status. Following is the status introduction:
                OK: antenna normal
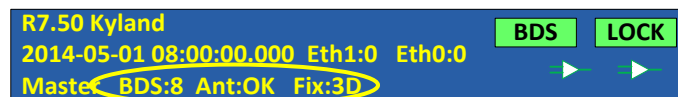   UV: low antenna power supply voltage

	NV: no antenna power supply voltage
	OC: antenna over current
Fix	GPS fix mode. Following is the mode introduction:
	3D: The best fix mode.
	2D: 2D fix mode. Not enough tracked satellites
	HD: Hold over. Just lost the tracking to satellites, but time accuracy should be OK.
	No: No fix. No satellites are tracked.

R7.50 Kyland   GPS   LOCK
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
Master GPS:8 Ant:OK   Fix:3D

[Figure 2-22] Sync Source: GPS

Use BDS as sync source, the display format is shown below:

BDS:xx Ant:xx Fix:xx	
BDS	The amount of locked BDS satellites at present.
Ant	BDS antenna status. Following is the status introduction:
	OK: antenna normal
	UV: low antenna power supply voltage
	NV: no antenna power supply voltage
	OC: antenna over current
Fix	BDS fix mode. Following is the mode introduction:
	3D: The best fix mode.
	2D: 2D fix mode. Not enough tracked satellites
	HD: Hold over. Just lost the tracking to satellites, but time accuracy should be OK.
	No: No fix. No satellites are tracked.

R7.50 Kyland   BDS   LOCK
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
Master BDS:8 Ant:OK   Fix:3D

[Figure 2-23] Sync Source: BDS

Use GLONASS as sync source, the display format is shown below:

GLN:xx Ant:xx Fix:xx	
GLN	The amount of locked GLONASS satellites at present.
Ant	GLONASS antenna status. Following is the status introduction:
	OK: antenna normal

UV: low antenna power supply voltage

NV: no antenna power supply voltage

OC: antenna over current

Fix   GLONASS fix mode. Following is the mode introduction:

3D: The best fix mode.

2D: 2D fix mode. Not enough tracked satellites

HD: Hold over. Just lost the tracking to satellites, but time accuracy should be OK.

No: No fix. No satellites are tracked.

```
R7.50 Kyland                              GLN    LOCK
2014-05-01 08:00:00.000  Eth1:0   Eth0:0:0
Master  GLN:8  Ant:OK  Fix:3D
```

[Figure 2-23] Sync Source: BDS

Use IRIG-B as sync source, the display format is shown below:

IRIG-B-xx-xxx   Frame: xxx

IRIG-B   IRIG-B input format. Following is the format introduction:

DC: IRIG-B DC

AC: IRIG-B AC

Modified Manchester Code

Frame   The number of IRIG-B input source frame

```
R7.50 Kyland                              IRIG    LOCK
2014-05-01 08:00:00.000  Eth1:0   Eth0:0
Master  IRIG-B-DC-F1   Frame:128
```

[Figure 2-24] Sync Source: IRIG-B-DC
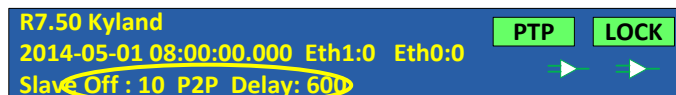
Use PTP as sync source, the display format is shown below:

Off: xxxxxx   Mode   Delay: xxxxxx

Off   PTP Offset, the unit is ns

Mode   PTP Mode, E2E or P2P

Delay   PTP Delay, the unit is ns

```
R7.50 Kyland                              PTP    LOCK
2014-05-01 08:00:00.000  Eth1:0   Eth0:0
Slave  Off : 10  P2P  Delay: 600
```

[Figure 2-11] Sync Source: PTP-P2P

R7.50 Kyland
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
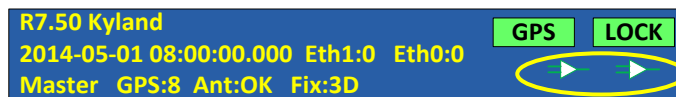**Slave Off : 10 E2E Delay: 600**   **PTP**   **LOCK**
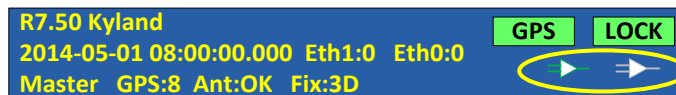
[Figure 2-12] Sync Source: PTP-E2E

Notes: When offset or delay is more than ±999999ns, character"*" is displayed instead of a number.

2.3.6.   Power Information

The power information is shown at right area of the third line which shows the working status of 2 channels power supply.

R7.50 Kyland
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
Master   GPS:8 Ant:OK   Fix:3D   **GPS**   **LOCK**

[Figure 2-13] Power Status: 2 channels with power

R7.50 Kyland
2014-05-01 08:00:00.000 Eth1:0   Eth0:0
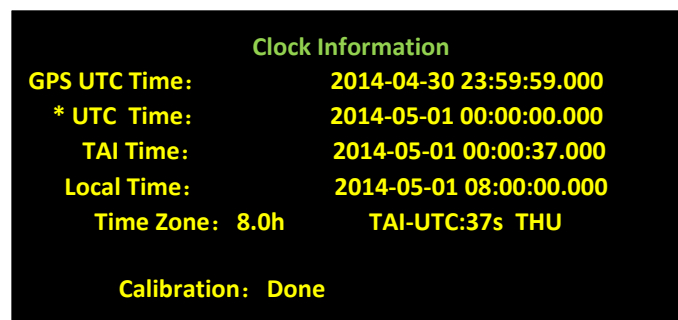**Master   GPS:8 Ant:OK   Fix:3D**   **GPS**   **LOCK**

[Figure 2-14] Power Status: 1 channel with power

2.4.   Reference Time

PTS-30 screen provides status indication information for reference time by default. User could touch "Property" button to enter reference time status interface, following is the retailed description.

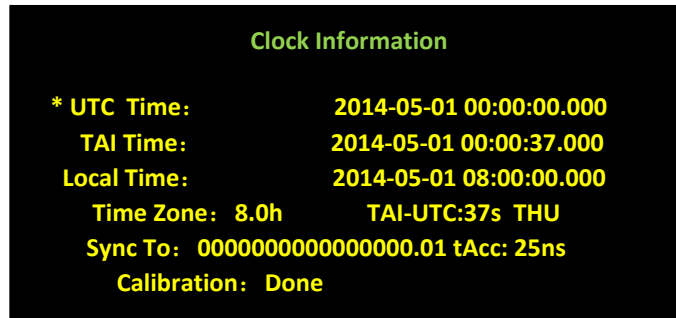When using non-PTP mode, system screen is shown as follows:

Clock Information
GPS UTC Time：   2014-04-30 23:59:59.000
* UTC Time：   2014-05-01 00:00:00.000
TAI Time：   2014-05-01 00:00:37.000
Local Time：   2014-05-01 08:00:00.000
Time Zone： 8.0h   TAI-UTC:37s THU

Calibration： Done

[Figure 2-15] Reference Time (GPS)

GPS UTC Time	UTC time information which is decoded by GPS
UTC Time	Local UTC time information
TAI Time	Local TAI time information

Local Time   Local time information with time zone

Time Zone Offset   Local time zone information

TAI-UTC   TAI and UTC offset

THU   What day is MON/TUE/WEN/THU/FRI/SAT/SUN

Oscillator Status   Show Oscillator status of time server

When using PTP mode, system screen is shown as follows:

Clock Information

* UTC Time：   2014-05-01 00:00:00.000
TAI Time：   2014-05-01 00:00:37.000
Local Time：   2014-05-01 08:00:00.000
Time Zone：8.0h   TAI-UTC:37s THU
Sync To：0000000000000000.01 tAcc: 25ns
Calibration：Done

[Figure 2-16] Reference Time (PTP)

GPS UTC Time   UTC time which is decoded by GPS

UTC   Time   Local UTC time information

TAI Time   Local TAI time information

Local Time   Local time information with time zone

Time Zone Offset   Local time zone information

TAI-UTC   TAI and UTC offset

THU   What day is MON/TUE/WEN/THU/FRI/SAT/SUN

Sync To   PTP master clock ID

tAcc   PTP master accuracy

Oscillator Status   Show Oscillator status of time server

Note: The Oscillator status will be shown as:

To be started   Clock has not synchronized to external source

In the warm up   Clock is synchronizing to external signal source

Hold need xx min   The minutes for synchronize to external source

Done   Clock has synchronized to external signal source

X Hour X Minute   To show hold time in hold status

2.5. Environment Status

User could touch "Property" button to enter the environment status interface.
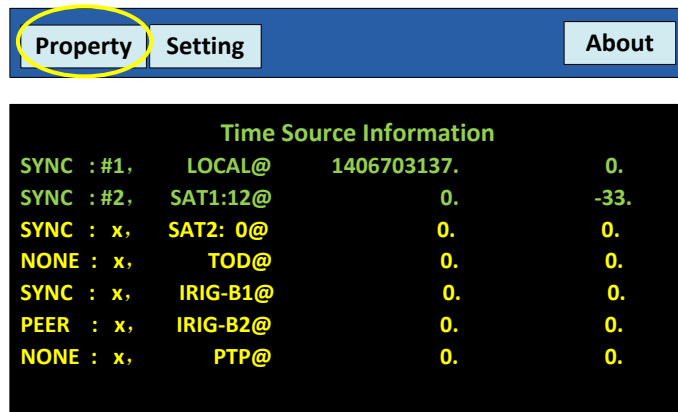
| Property | Setting | | About |
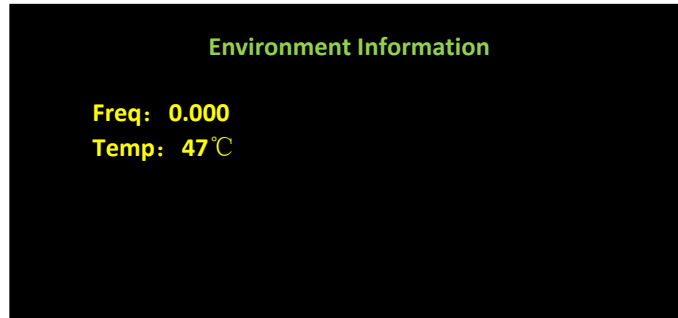
[Figure 2-17] Environment Status

Environment status interface displays current working temperature and power frequency measurement value.

2.6. Sync Source Status

User could touch "Property" button to enter the sync source status interface.

[Figure 2-18] Sync Source Status

Sync source status interface displays current working mode, status and time information for clock source. External source could be set into SYNC, PEER, NONE mode by the configuration. In NONE mode, it means this external source is not used; in PEER mode, it means this external source is used for the redundancy time source; in SYNC mode, it means this external source is used for the individual sync source. System supports the status monitoring for SAT1, SAT2, TOD, IRIG-B1, IRIG-B2 and PTP. LOCAL means the working status for local clock.
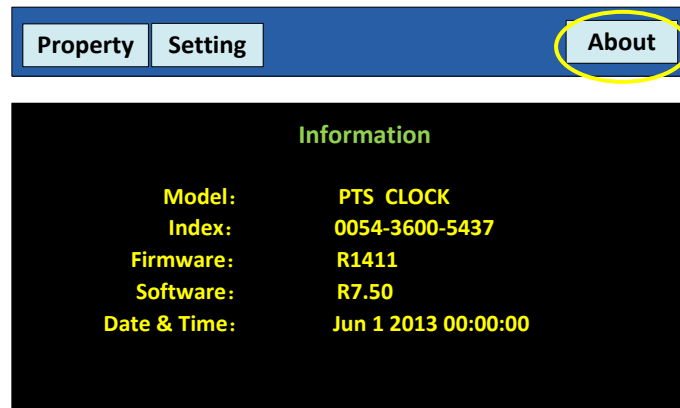
2.7. Parameter Setting

User could touch "Setting" button to enter parameter setting interface which is shown below (refer to chapter 3 for more details).

2.8.   Device Information

User could touch "About" button to view device information, including instrument model, instrument index, firmware version, and software version and update date.
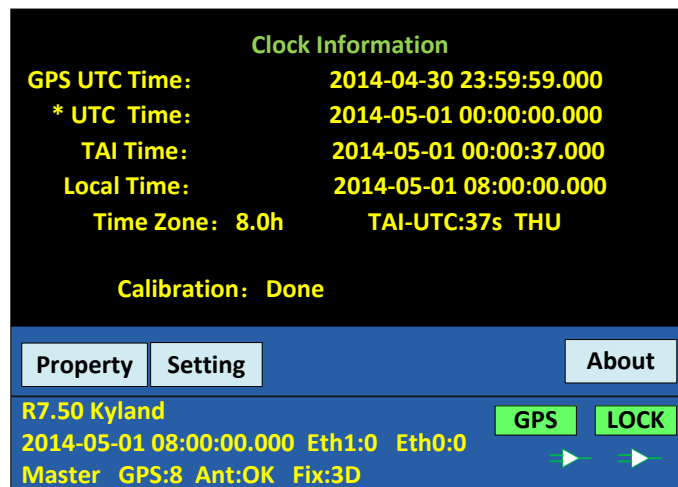

[Figure 2-19] Device Information

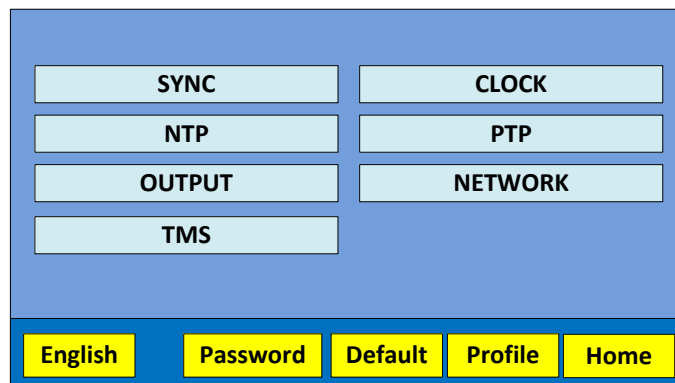# 3.   Operations

3.1. Settings

3.1.1. Setting Function

Once set up PTS-30, user might see the main interface as shown below. Select "Setting" button to enter to perform further operation.

[Figure 3-1] Main Interface

6 settings options are provided on the settings page.

[Figure 3-2] Settings Interface

Item	Specification
Sync source settings	Set the external clock source including GPS, BDS, GLONASS, IRIG-B, and PTP. Also set the priority for signal source, IRIG-B time service and antenna time delay compensation, etc.

Clock settings	Set reference time as UTC or TAI, time zone offset and output modes, etc.
NTP settings	Set NTP timing signal output, and time zone offset between UTC in hour.
PTP settings	Set timing modes, sync time interval, delay time interval, priority and vLAN etc.
Output settings	Set the output channel SO,O1~O5, and the output signal, signal delay compensation, polarity, etc.
Network settings	Set network IP address, subnet mask and operating modes.
TMS settings	Set time management information for goose publisher and subscriber

3.1.2.   Setting Operation

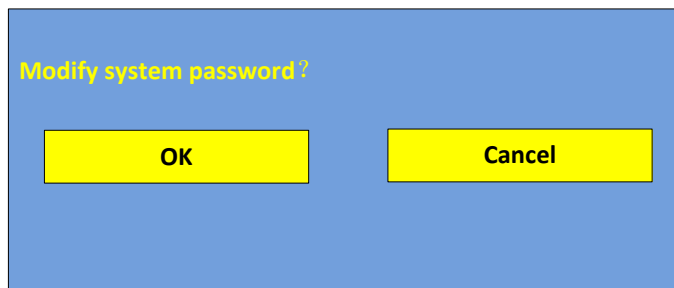There are other four functions listed at the bottom of settings page.

| **English** | **Password** | **Default** | **Profile** | **Home** |

[Figure 3-3] Function Buttons

Language Switch: Two languages are supported, Chinese and English.

| 中文 | **English** |

[Figure 3-4] Language Switch Buttons

Modify Password: Select the "Password" button and modify system password.
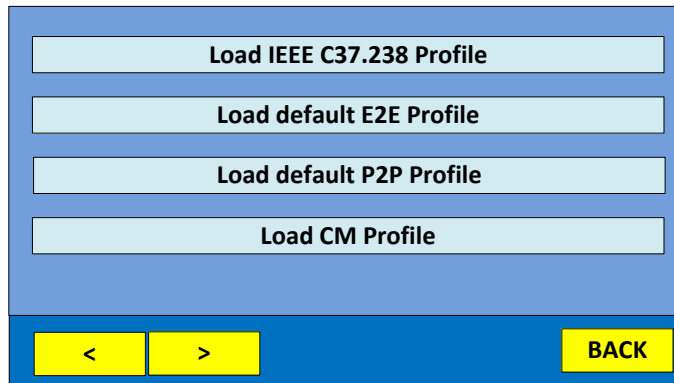
Modify system password？

| **OK** | **Cancel** |

[Figure 3-5] Modify password Buttons

Default Setting: Select the "Default" button and system could be set as default.

Load default parameters？

| **OK** | **Cancel** |
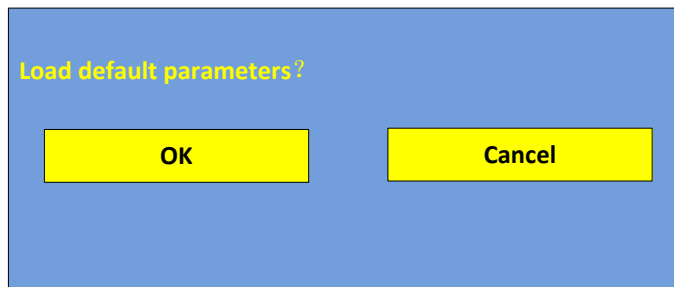
[Figure 3-6] Default setting Buttons

PTP Profiles: Four IEEE 1588 working templates are provided.

| Load IEEE C37.238 Profile |
| Load default E2E Profile |
| Load default P2P Profile |
| Load CM Profile |

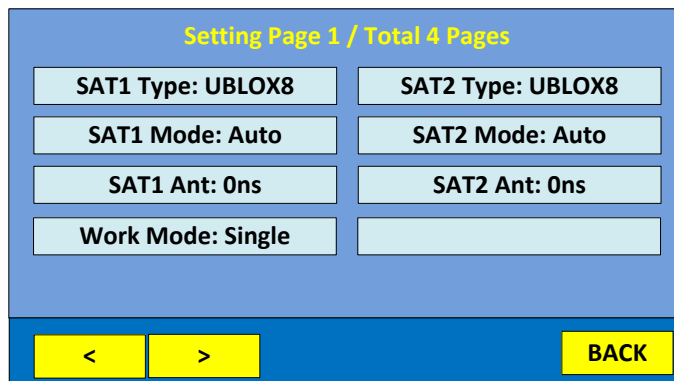| < | > | | BACK |

[Figure 3-7] Template Selection Buttons

Exit&Save: At any time, press 'Home' button to quit the settings change mode. PTS-30 will ask for confirm the changed setting and then quit. If you select cancel option, the changed setting will be lost and system still uses the old setting. The confirm password is always 8.

Setting has been changed. Save？

| OK | Cancel |
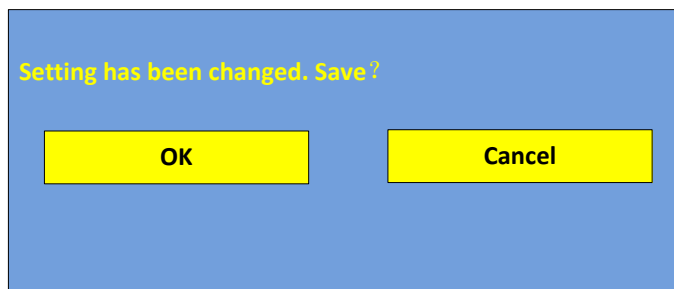
[Figure 3-8] Setting Confirmation

3.2. Sync Source Settings

In setting screen, press 'SYNC' button to modify sync source settings. Various sync source settings are provided by the page switch buttons. There are totally 4 pages available.


Setting Page 1 / Total 4 Pages

SAT1 Type: UBLOX8	SAT2 Type: UBLOX8
SAT1 Mode: Auto	SAT2 Mode: Auto
SAT1 Ant: 0ns	SAT2 Ant: 0ns
Work Mode: Single	

| < | > | | BACK |

[Figure 3-9] Sync Source Setting: Page 1

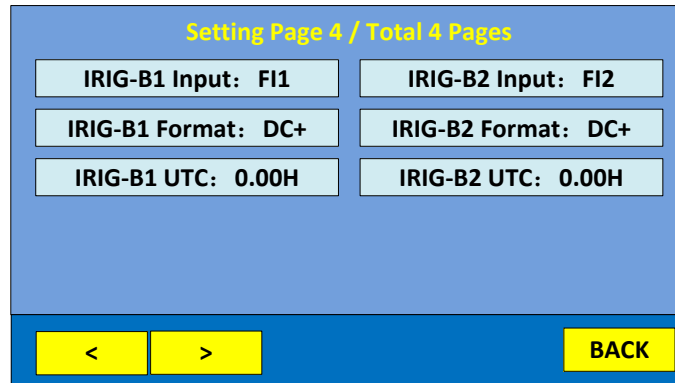| Function Button	Parameter Setting	Description
Satellite Type	UBLOX5/UBLOX8/AT3340 /HWA210B/HWA210L	Select different module for each satellite channel to receive satellite signal from sky.
Satellite Mode	Auto/A-BDS/A-GPS/A-GLN/F-BDS/F-GPS/F-GLN	When you select a multiple mode receiver for each satellite channel, you might use this parameter to make it work at right mode.
Satellite Antenna	0ns	According to different antenna types and lengths, system implements time delay compensation for each satellite channel.
Working Mode	Single/Multiple	Single source enabled(only one good external source can make clock work)/Multiple source enabled(compare with multiple good time sources in order to select best one as the reference source)

Setting Page 2 / Total 4 Pages

SAT1：1	SAT2：2
IRIG-B1：3	IRIG-B2：4
PTP：5	

< > BACK
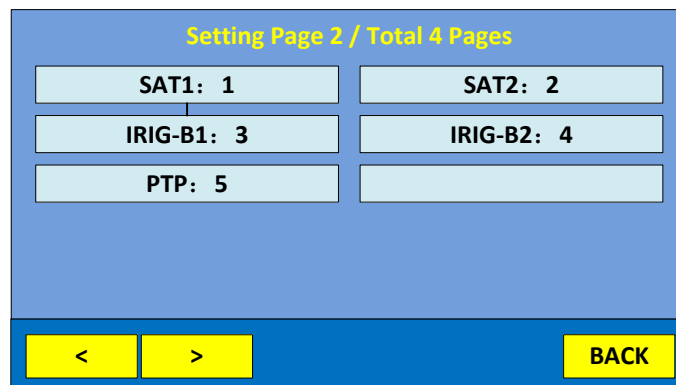
[Figure 3-10] Sync Source Setting: Page 2

Function Button	Parameter Setting	Description
Source Priority	1~10	Set the priority for external signal source. 1 is highest source and 10 is lowest source.

Setting Page 3 / Total 4 Pages

SAT1：SYNC	SAT2：SYNC
IRIG-B1：SYNC	IRIG-B2：PEER
PTP：NONE	

< > BACK
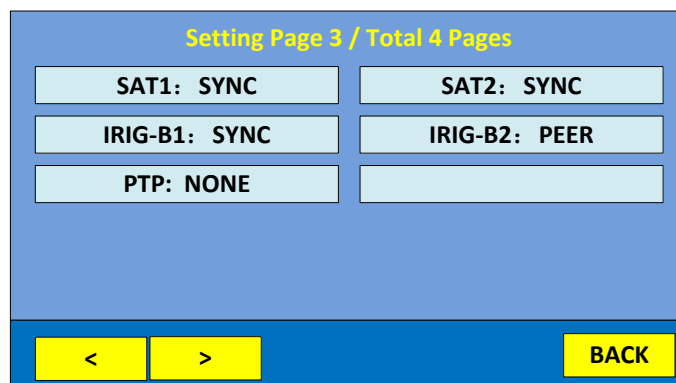
[Figure 3-11] Sync Source Setting: Page 3

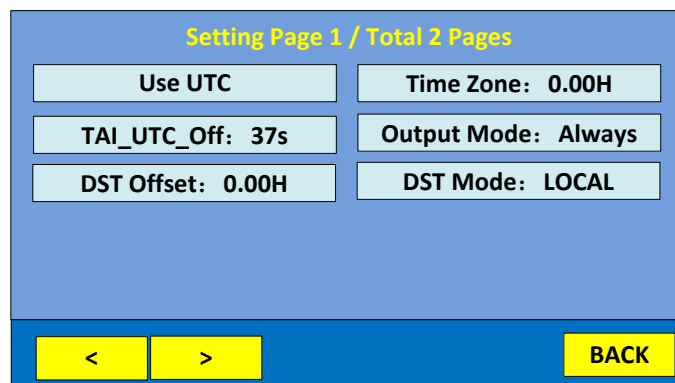| Function Button	Parameter Setting	Description
Source Mode	SYNC/PEER/NONE	To set source working mode. SYNC is individual sync source, PEER is redundancy sync source and NONE is anything to do.

Setting Page 4 / Total 4 Pages

IRIG-B1 Input：FI1	IRIG-B2 Input：FI2
IRIG-B1 Format：DC+	IRIG-B2 Format：DC+
IRIG-B1 UTC：0.00H	IRIG-B2 UTC：0.00H

     <   **>**   **BACK**

[Figure 3-12] Sync Source Setting: Page 4

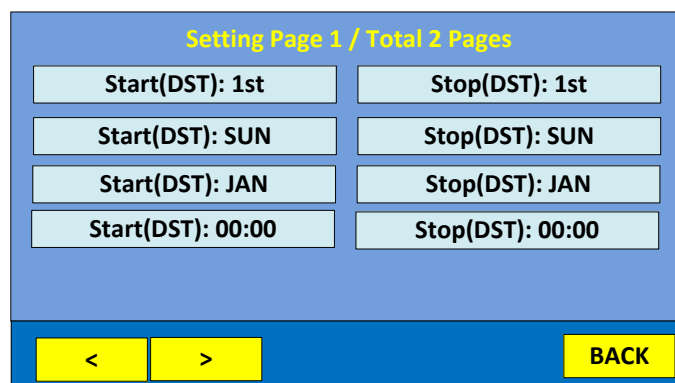| Function Button	Parameter Setting	Description
IRIG-B1/2 Input	FI1/FI2	To set IRIG-B1/B2 input time signal.
IRIG-B1/2 Format	DC+/DC-	To set IRIG-B1/B2 input format, including DC+ (positive polarity DC), DC-(negative polarity DC) IRIG-B signal.
IRIG-B1/B2 UTC	0.00H	Set time offset between IRIG-B and UTC.

3.3. Clock Settings

In setting screen, press 'CLOCK' button to modify clock settings. Various clock settings are provided by the page switch buttons. There are totally 2 pages available.

Setting Page 1 / Total 2 Pages

Use UTC	Time Zone：0.00H
TAI_UTC_Off：37s	Output Mode：Always
DST Offset：0.00H	DST Mode：LOCAL

     <   **>**   **BACK**

[Figure 3-13] Clock Setting: Page 1

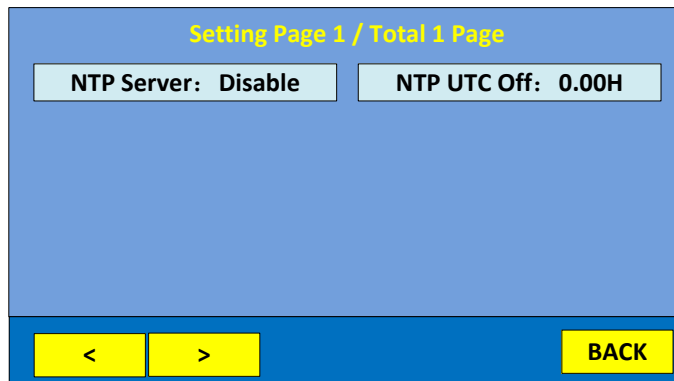| Function Button	Parameter Setting	Description
Use UTC	UTC / TAI	Set UTC time or TAI time as required
Time Zone	0.00H	Set time zone offset to ensure required time zone display.
TAI_UTC_Off	35s	Set time zone offset between TAI and UTC.
Output Mode	Always/Lock	Always means time server has output signals in any status. Lock means time server only has output signals after timer server is locked by external time source.
DST Offset	0.00H	Set how many hours need to adjust at DST period.
DST Mode	UTC/LOCAL	Set use which reference time to convert DST time.

Setting Page 1 / Total 2 Pages

Start(DST): 1st	Stop(DST): 1st
Start(DST): SUN	Stop(DST): SUN
Start(DST): JAN	Stop(DST): JAN
Start(DST): 00:00	Stop(DST): 00:00

| < | > | | BACK |

[Figure 3-14] Clock Setting: Page 2

Function Button	Parameter Setting	Description
Start(DST): 1st	1st/2nd/3rd/4th/5th	
Start(DST): SUN	MON/TUE/WEN/THU /FRI/SAT/SUN	
Start(DST): JAN	JAN/FEB/MAR/APR/MAY/JUN/JUL/AUG/SEP/OCT/NOV/DEC	Set start date of DST.
Start(DST): 0.00H	00:00~24:00	
Stop(DST): 1st	1st/2nd/3rd/4th/5th	
Stop(DST): SUN	MON/TUE/WEN/THU /FRI/SAT/SUN	Set stop date of DST.
Stop(DST): JAN	JAN/FEB/MAR/APR/MAY/J	

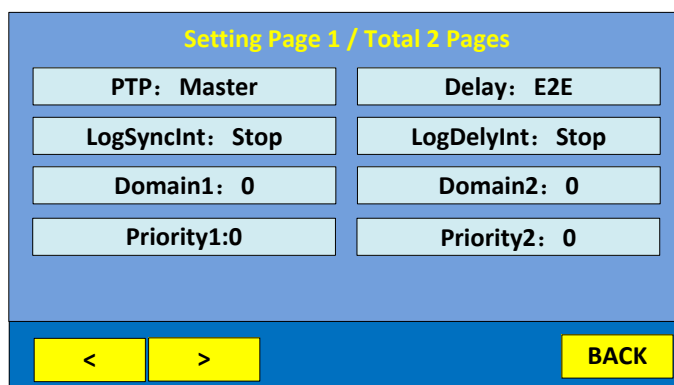|	UN/JUL/AUG/SEP/OCT/NO V/DEC	
Stop(DST): 0.00H	00:00~24:00	

3.4. **NTP Settings**

In setting screen, press 'NTP' button to modify NTP settings. Various NTP settings are provided by the page switch buttons. There is totally 1 page available.

Setting Page 1 / Total 1 Page

NTP Server：Disable   NTP UTC Off：0.00H

< > BACK

[Figure 3-15] NTP Setting: Page 1

Function Button	Parameter Setting	Description
NTP Server	Enable/Disable	To enable or disable NTP server of time server.
NTP_UTC_Off	0.00H	Set time offset between NTP and UTC.

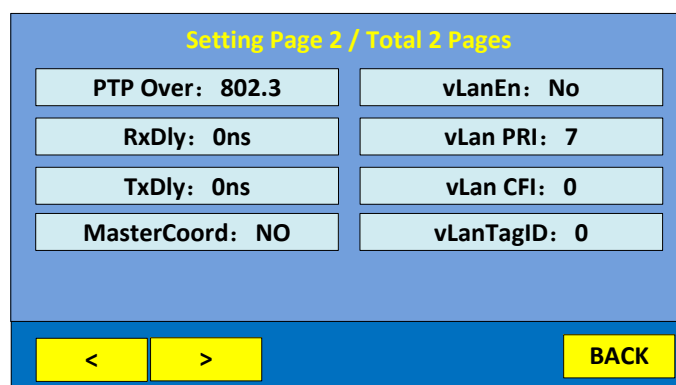### 3.5. **PTP Settings**

Setting Page 1 / Total 2 Pages

PTP：Master   Delay：E2E
LogSyncInt：Stop   LogDelyInt：Stop
Domain1：0   Domain2：0
Priority1:0   Priority2：0

< > BACK

[Figure 3-16] PTP Setting: Page 1

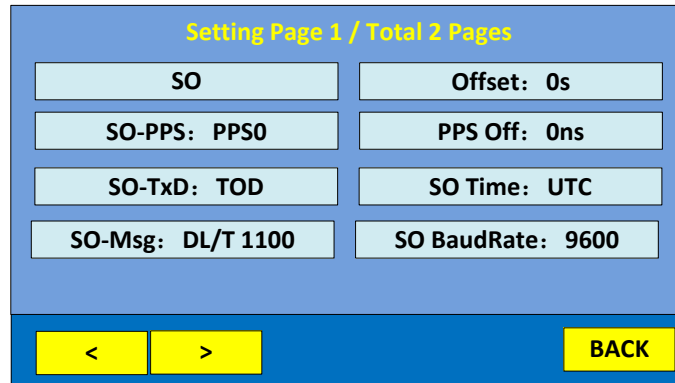| Function Button	Parameter Setting	Description
PTP	Master/Slave /Boundary	Set PTP working mode.
Delay	E2E / P2P / Disable	Set clock delay measurement mode or disable this function.

LogSyncInt	-8~4 / Stop	Set the PTP sync message rate of PTP master clock. Setting value is n, actual interval is 2^n seconds. Valid range is from -8 to 4 and Stop. Default value is Stop.
LogDelyInt	-8~4 / Stop	Set delay measurement rate. Setting value is n, actual interval is 2^n seconds. Valid range is from -8 to 4 and Stop. Default value is Stop.
Domain1/2	0~3	Set the working domain name for PTP message.
Priority1/2	0~255	Set working priority for PTP message.

```
Setting Page 2 / Total 2 Pages
  PTP Over：802.3        vLanEn：No
  RxDly：0ns             vLan PRI：7
  TxDly：0ns             vLan CFI：0
  MasterCoord：NO        vLanTagID：0

  <    >                         BACK
```

[Figure 3-17] PTP Setting: Page 2

Function Button	Parameter Setting	Description
PTP Over	802.3 / IPv4	Set the transmission protocol for PTP.IEEE802.3 and Ipv4 are supported.
RxDly	0ns	Set the time delay for receiving PTP message.
TxDly	0ns	Set the time delay for sending PTP message.
MasterCoord	YES/NO	Set master coordination function with BMC.
vLanEn	YES/NO	Set whether to send vLan information.
vLanPRI	0~7	Set vLan priority.
vLanCFI	0~1	Set vLan ID information.
vLanTagID	0~4095	Set vLan ID information.

3.6. **Output Settings**

Setting Page 1 / Total 2 Pages	
SO	Offset：0s
SO-PPS：PPS0	PPS Off：0ns
SO-TxD：TOD	SO Time：UTC
SO-Msg：DL/T 1100	SO BaudRate：9600
< >	BACK

[Figure 3-18] Output Setting: Page 1(SO)

Function Button	Parameter Setting	Description
SO	SO/O1(Out1)/O2(Out2)/O3(Out3)/O4(Out4)/O5(Out5)	Set the output signal, touch SO button to change programmable output channel.
SO-PPS	PPS,IRIG-B,PPM,PPH	Set the signal type for the SO-PPS.
SO-TxD	TOD	Set the signal type for SO-TxD.
SO-MSG	DLT1100/CM-TOD/CMBB	Set the coding format for serial port message.
SO Off	0s	Set SO second offset.
SO-PPS Off	0ns	Set SO-PPS offset.
SO Time	UTC / TAI / Local	Set SO output time format which can be set to UTC/TAI/Local time.
SO BaudRate	300~115200	Set the working baud rate for serial port, ranging from 300 to 115200.

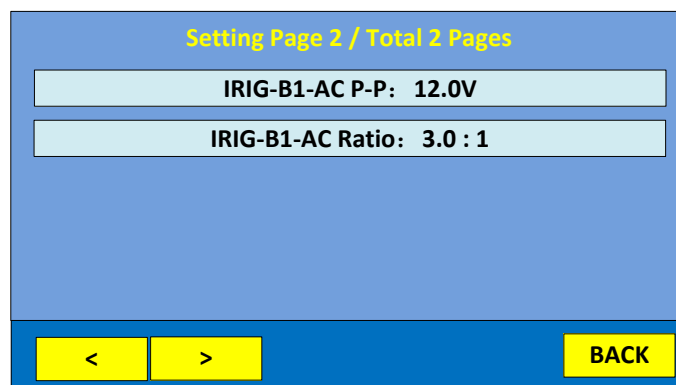Note: As a functional switching button, user can switch to the SO channel and O1~O5 channels.

Setting Page 1 / Total 2 Pages	
O1	Offset：0s
O1：PPS1	PPS1 Off：0ns
IRIG-B Mode: Odd	IRIG-B Time：UTC
	IRIG-B Polarity：+
< >	BACK
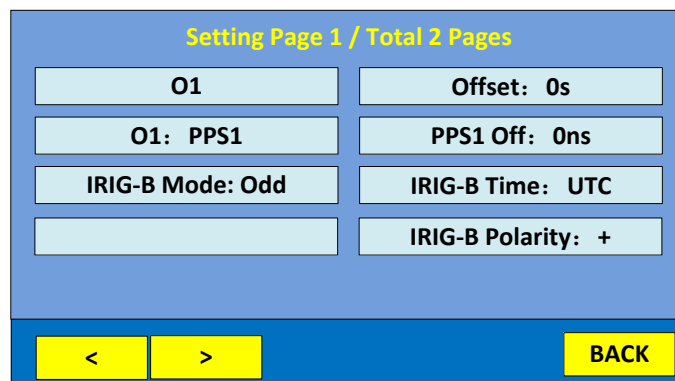
[Figure 3-19] Output Setting: Page 1(O1~O5)

Function Button	Parameter Setting	Description
O1~O5(Out1)	SO/O1(Out1)/O2(Out2)/O3(	Set the output signal, touch SO button to

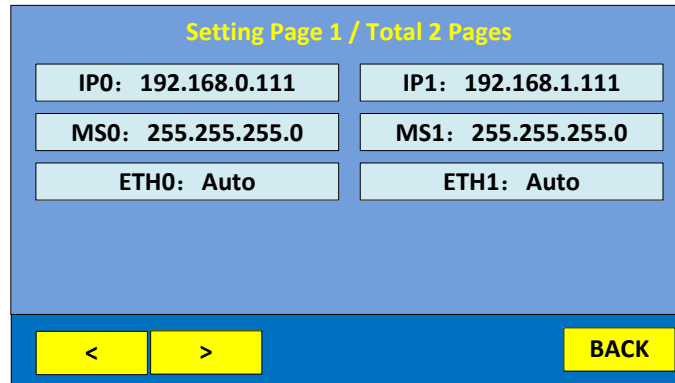|	Out3)/O4(Out4)/O51(Out5)	change programmable output channel.
O1	PPS,IRIG-B,PPM,PPH	Set the signal type for the O1~05.
IRIG-B Mode	Even /Odd	Set IRIG-B check code: even check, odd check.
IRIG-B Off	0s	Set second offset for IRIG-B.
PPS1 Off	0ns	Set PPS offset for PPS1~5.
IRIG-B Time	UTC/TAI/Local	Set IRIG-B output time format which can be set to UTC/TAI/Local time.
IRIG-B Polarity	+/-	Set IRIG-B output signal polarity.

Note: Although the physical channel is different among O1~O5, the parameter settings are the same, above figure is the O1 output settings, user can switch to O2~O5 channel by touching O1 button.

```
           Setting Page 2 / Total 2 Pages
      ┌──────────────────────────────────────┐
      │      IRIG-B1-AC P-P：  12.0V          │
      └──────────────────────────────────────┘
      ┌──────────────────────────────────────┐
      │      IRIG-B1-AC Ratio：  3.0 : 1      │
      └──────────────────────────────────────┘


      ┌───────┐ ┌───────┐           ┌───────┐
      │   <   │ │   >   │           │ BACK  │
      └───────┘ └───────┘           └───────┘
```

[Figure 3-20] Output Setting: Page 2

Function Button	Parameter Setting	Description
IRIG-B1-AC Out P-P	3.OV~12.0V	Set the peak-to-peak value for IRIG-B-AC, ranging from 3.0V to 12.0V, adjusting step length is 0.5V, default value is 12.0V.
IRIG-B1-AC Out Ratio	3.0:1~6.0:1	Set the modulation ratio for IRIG-B-AC, ranging from 3.0:1~6.0:1, adjusting step length is 0.5:1; default value is 3.0:1.

3.7.   **Network Settings**

Setting Page 1 / Total 2 Pages

IP0：192.168.0.111	IP1：192.168.1.111
MS0：255.255.255.0	MS1：255.255.255.0
ETH0：Auto	ETH1：Auto

| < | > | | BACK |

[Figure 3-21] Network Setting: Page 1

Function Button	Parameter Setting	Description
IP0 /IP1	ETH0:192.168.0.111 ETH1:192.168.1.111	Set ETH0/1 IP address, the default is 192.168.0.111/ 192.168.1.111.
MS0 / MS1	ETH0:255.255.255.0 ETH1:255.255.255.0	Set ETH0/1 Subnet mask address, the default is 255.255.255.0.
ETH0 / ETH1	Auto/Force	PTS-30 can provide more network type. One of them can set ETH0/ETH1 mode work with Auto or Force.
	Auto, 100M-FX FDX, 100M-FX-HDX, 1000M-X FDX, 1000M-X HDX	PTS-30 can provide more network types. One of them can set ETH0/ETH1 mode work with Auto or work with 100M and 1000M fiber.

Setting Page 2 / Total 2 Pages

| IP2：192.168.2.111 | IP3：192.168.3.111 |
| MS2：255.255.255.0 | MS3：255.255.255.0 |

| < | > | | BACK |
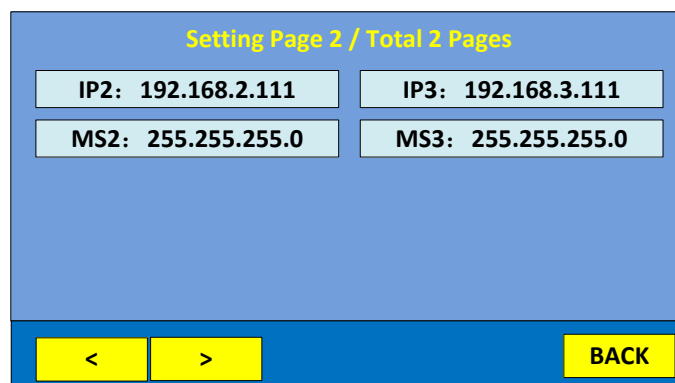
[Figure 3-22] Network Setting: Page 2

Function Button	Parameter Setting	Description
IP2 /IP3	ETH2:192.168.2.111	Set ETH2/3 IP address, the default is

	ETH3:192.168.3.111	192.168.2.111/ 192.168.3.111.
MS2 / MS3	ETH2:255.255.255.0	Set ETH2/3 Subnet mask address, the default is
	ETH3:255.255.255.0	255.255.255.0.

3.8. TMS Settings (Optional)

```
Setting Page 1 / Total 1 Pages

    GOOSE-P0              GOOSE-P1

    GOOSE-S0              GOOSE-S1




    <      >                    BACK
```
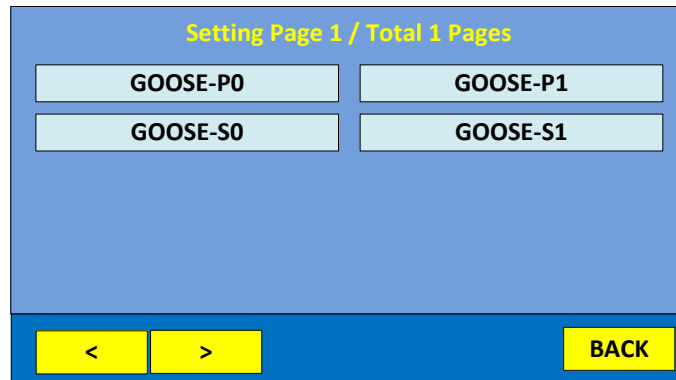
[Figure 3-23] TMS Setting: Page 1

Function Button	Parameter Setting	Description
GOOSE-P0	(Go to publisher screen)	Set goose publisher information of eth0.
GOOSE-P1	(Go to publisher screen)	Set goose publisher information of eth1.
GOOSE-S0	(Go to subscriber screen)	Set goose subscriber information of eth0.
GOOSE-S1	(Go to subscriber screen)	Set goose subscriber information of eth1.

3.8.1. GOOSE Publisher

The publisher screen will be shown as the following diagram:

(There are 2 pages information)

```
Setting Page 1 / Total 2 Pages

ETH0: Disable        01.0C.CD.01.00.01

    gID: PTSTTR/LLN0$GO$gocb0

    Ref:PTSTTR/LLN0$GO$gocb0

    Dat: PTSTTR/LLN0$dsGOOSE0


    <      >                    BACK
```
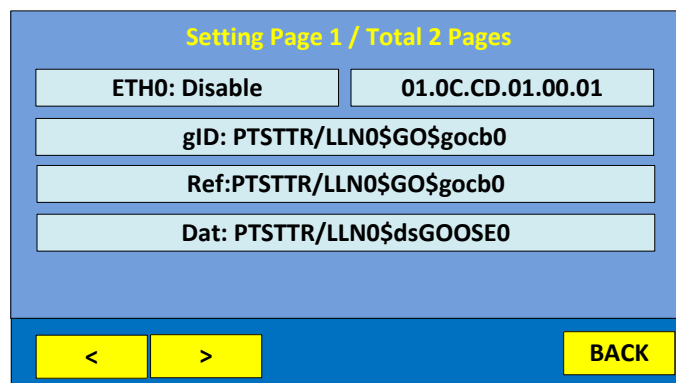
[Figure 3-24] TMS Publisher Setting: Page 1

Function Button	Parameter Setting	Description
ETH0:Disable	Enable/Disable	To enable or disable GOOSE publisher function on this network (eth0 for GOOSE-P0 or eth1 for

		GOOSE-P1)
MAC	01.0C.CD.01.00.01	Set GOOSE MAC address
gID	PTSTTR/LLN0GOgocb0	Set GOOSE ID
Ref	PTSTTR/LLN0GOgocb0	Set GOOSE reference
Dat	PTSTTR/LLN0$dsGOOSE0	Set GOOSE dataset
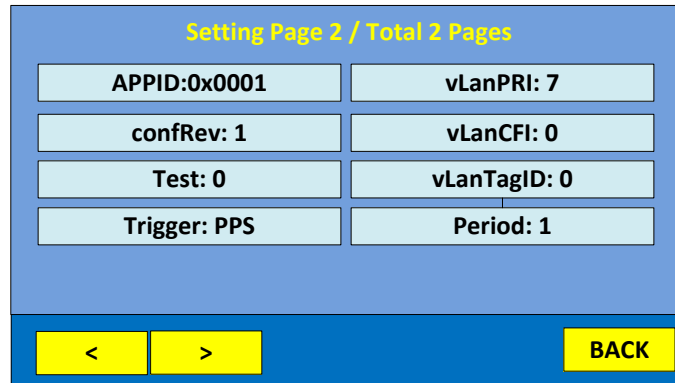
[Figure 3-25] TMS Publisher Setting: Page 2

Function Button	Parameter Setting	Description
APPID	0x0001	Set APPID parameter of GOOSE message
Test	0	Set Test flag information of GOOSE message
confRev	1	Set configuration version of GOOSE message
vLanPRI	0~7	Set vLan priority
vLanCFI	0~1	Set vLan CFI
vLanTagID	0~4095	Set vLan ID information
Trigger	PPS/PPM/PPH	Set trigger signal to send out GOOSE message
Period	0~255	Set period to send out GOOSE message, the 0 means no data change and the non-zero means system will send a new GOOSE when the current time at PPS, PPM or PPH can be divisible by trigger period.

3.8.2. GOOSE Subscriber

The subscriber screen will be shown as the following diagram:

(There are 2 pages information)

Setting Page 1 / Total 2 Pages

| ETH0: Disable | 01.0C.CD.01.00.01 |

gID: PTSTTR/LLN0GOgocb0

Ref:PTSTTR/LLN0GOgocb0

Dat: PTSTTR/LLN0$dsGOOSE0

| < | > | BACK |
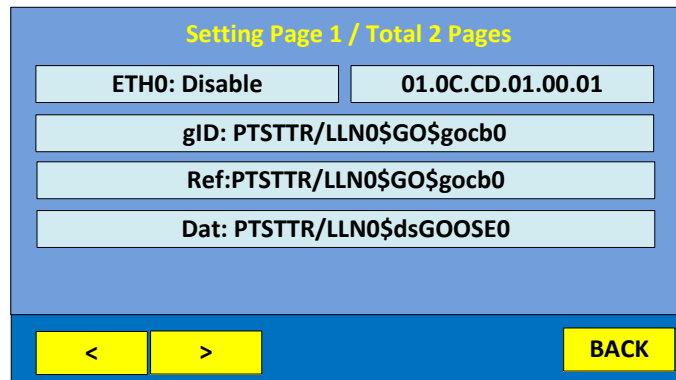
[Figure 3-26] TMS Subscriber Setting: Page 1

Function Button	Parameter Setting	Description
ETH0:Disable	Enable/Disable	To enable or disable GOOSE subscriber function on this network (eth0 for GOOSE-S0 or eth1 for GOOSE-S1)
MAC	01.0C.CD.01.00.01	Set GOOSE MAC address
gID	PTSTTR/LLN0GOgocb0	Set GOOSE ID
Ref	PTSTTR/LLN0GOgocb0	Set GOOSE reference
Dat	PTSTTR/LLN0$dsGOOSE0	Set GOOSE dataset

Setting Page 2 / Total 2 Pages

| Entry: 0 | Byte: 0 |

| Bit: 0 | |

| < | > | BACK |
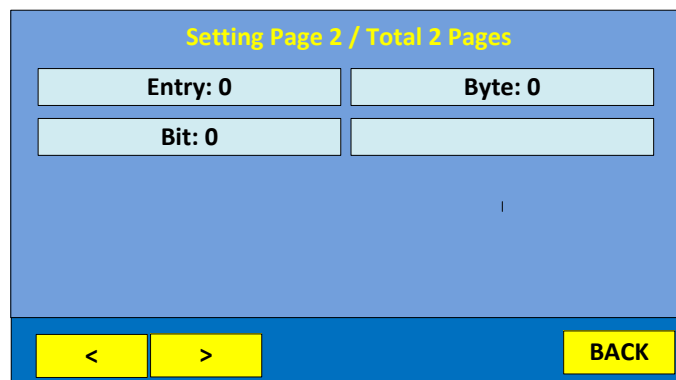
[Figure 3-27] TMS Subscriber Setting: Page 2

Function Button	Parameter Setting	Description
Entry	0~31	Set the entry index of GOOSE message.
Byte	0~31	Set the byte position of entry information
Bit	0~7	Set the bit position of byte information.

Notes: If GOOSE message has structure data object, system will decode these message and calculate the index according to the simple entry.

When change any options in the main screen, user can use the navigation button '<' and '>' to switch the settings page. Touch the corresponding button to set parameters.

According to screen tips, select or type the correct settings.

Figure Index