

Leader

LV5600 / LV7600-SER05/06 New Function

Application Information

2020.4.2

Feature

1. SER06 buffer measurement ※ ST2110 only, And SER06 only
2. SER32 Packet Error Insertion ※ Only ST2110 And cannot decode video, audio and ANC of IP signal when error and jitter loaded.
SER32 Packet Jitter Insertion ※ Only ST2110 And cannot decode video, audio and ANC of IP signal when error and jitter loaded.
3. SER32 Lip sync pattern support
4. SER05/06 Payload ID insertion of IP / SDI conversion output ※ ST2110 only
5. SER05/06 Redundant measurement
6. SER05/06 PTP time log support
7. SER05/06 PTP Information display
8. SER05/06 Added display mode for packet jitter (AUDIO, ANC) * ST2110 only
9. SER05/06 CSV file output of graph data

Notes on updating with SER06

※ When updating the LV5600 / LV7600 with SER06 from Ver. 4.5 to Ver. 4.6 or later, it is necessary to update the same firmware twice. Check the following for the update procedure.

※ LV5600/ LV7600 without SER06 is not relevant.

- Update procedure from Ver.4.5 to Ver.4.6 or later.

1. SYS → F7 : INITIALIZE → F7 : FIRMWARE UPDATE → F3 : UPDATE YES (Example Ver.4.6)
2. Update start
3. When the update is complete, you will be prompted to update again.
4. SYS → F7 : INITIALIZE → F7 : FIRMWARE UPDATE → F3 : UPDATE YES
5. Update start
6. Completed if no message prompting re-update is displayed.

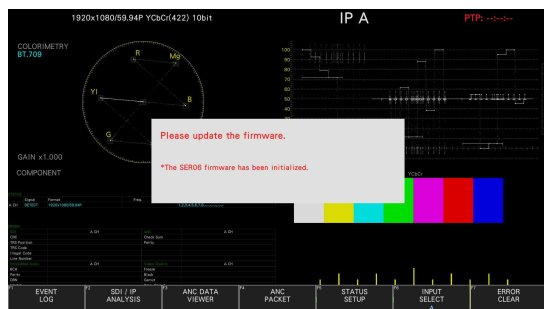


Notes on updating with SER06

※ When updating the LV5600 / LV7600 with SER06 from Ver. 4.6 or later to Ver. 4.5 or lower after updating to Ver. 4.6 or later, initialize the SER06 by the following procedure and update again. is needed.

※ Preset data etc. will not be erased by “SER06 FW INIT YES” in step 8.

- Procedure to update to Ver.4.6 or later after downgrading from Ver.4.6 or later to less than Ver.4.5
 1. SYS → F7 : INITIALIZE → F7 : FIRMWARE UPDATE → F3 : UPDATE YES (Example Ver.4.5)
 2. Update start
 3. Update completed
 4. SYS → F7 : INITIALIZE → F7 : FIRMWARE UPDATE → F3 : UPDATE YES (Example Ver.4.6)
 5. Update start
 6. When the update is complete, you will be prompted to update again.
 7. Restart while holding down VPOS and HPOS.
 8. F5 : SER06 FW INIT YES (Be careful not to press "F3: SRAM / FLASH INIT YES".)
 9. You will be asked to update.
 10. SYS → F7 : INITIALIZE → F7 : FIRMWARE UPDATE → F3 : UPDATE YES (Example Ver.4.6)
 11. If no re-update message is displayed, you are done.

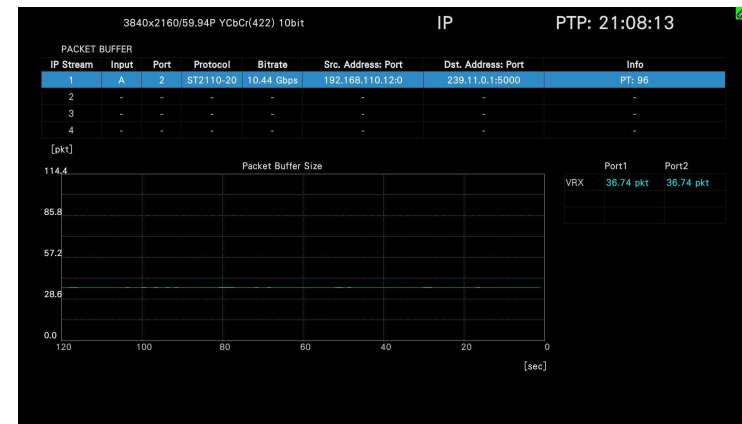
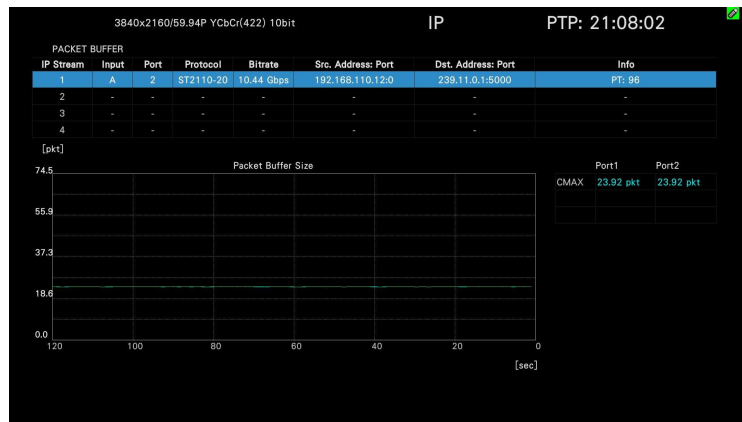


1. Buffer Measurement

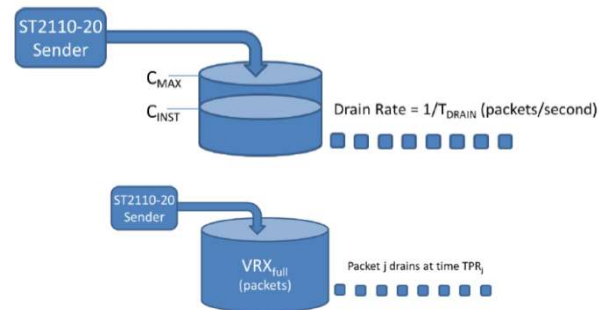
Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·4 next menu → F·3 BUFFER

Displays the measured values of CMAX and VRX when the transmission type of SMPTE ST2110-21 is Narrow.
CMAX represents the full value of the packet being transmitted. VRX indicates the value of the virtual receive buffer.



Displays CMAX and VRX values for both ports 1/2.
CMAX, VRX described in SMPTE ST2110-21
Calculated based on the formula shown on the right.



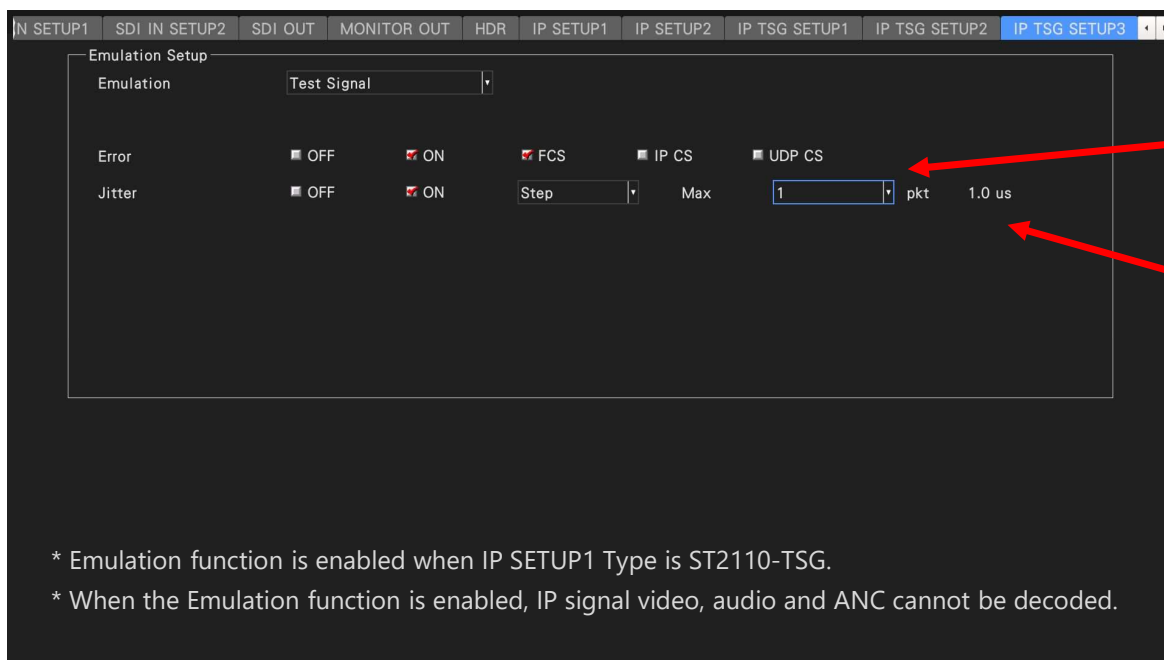
$$C_{MAX} = \text{MAX} \left(4, \text{INT} \left(\frac{N_{PACKETS}}{43200 \times R_{ACTIVE} \times T_{FRAME}} \right) \right)$$

$$VRX_{FULL} = \text{MAX} \left(\text{INT} \left(\frac{1500 \times 8}{MAXIP} \right), \text{INT} \left(\frac{N_{PACKETS}}{27000 \times T_{FRAME}} \right) \right) \quad 5$$

2. Packet Emulation

Operation

SYS → F·1 SIGNAL IN OUT → F·2 PREV TAB or F·3 NEXT TAB → IP TSG SETUP3



Error Insertion : Generates a checksum error.

FCS : Insert checksum error of MAC frame

IP CS : Insert checksum error of IP

UDP CS : Insert UDP checksum error

Jitter Insertion : Generates fluctuations in the packet transmission interval.

Range: 1-100 (packet)

※ 1-20 (packet) at 4K signal output

※ The time to generate jitter varies depending on the output signal format.

※ There is an error of $\pm 10\%$ in the time to generate jitter.

※ The RTP time stamp has a delay twice as long as the packet transmission interval.

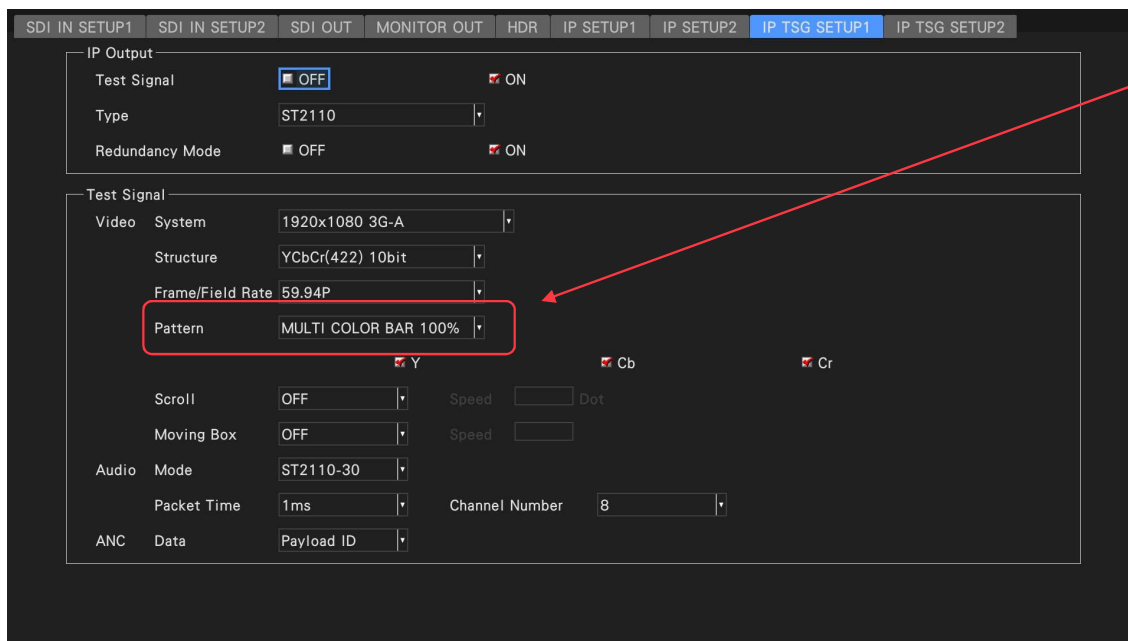
※ Emulation function is enabled when Type is ST2110-TSG.

※ When the Emulation function is enabled, IP signal video, audio and ANC cannot be decoded.

3. LipSync Test Pattern

Operation

SYS → F·1 SIGNAL IN OUT → F·2 PREV TAB or F·3 NEXT TAB → IP TSG SETUP2



LIP SYNC can be selected.

* SER03 DIGITAL AUDIO is required to output LIP SYNC patterns.



4. PayLoad ID Insert

Operation

SYS → F·1 SIGNAL IN OUT → F·2 PREV TAB or F·3 NEXT TAB → IP SETUP1

- When outputting an IP input signal as an SDI signal, insert the Payload ID that matches the input signal and output. 4G signal is converted to 3G-Quad Link signal, so 3G-Quad Link Payload ID is inserted. When OFF, the payload ID superimposed on the ANC packet of ST2110-40 is inserted.

SDI IN SETUP2 SDI OUT MONITOR OUT HDR IP SETUP1 IP SETUP2 IP TSG SETUP1 IP TSG SETUP2 IP TSG SETUP3 NMOS

IP Setup

Type: ST2110

Redundancy Mode: OFF ON

IP Input: 1

IP Stream: 1

SDI Out PID Insert: OFF ON

Video

VLAN ID:

Source Address:

Destination Address: 239 11 10 1

Destination Port: 0 5 0 0

Audio

VLAN ID:

Source Address:

Destination Address:

Destination Port:

ANC

VLAN ID:

Source Address:

Destination Address:

Destination Port:

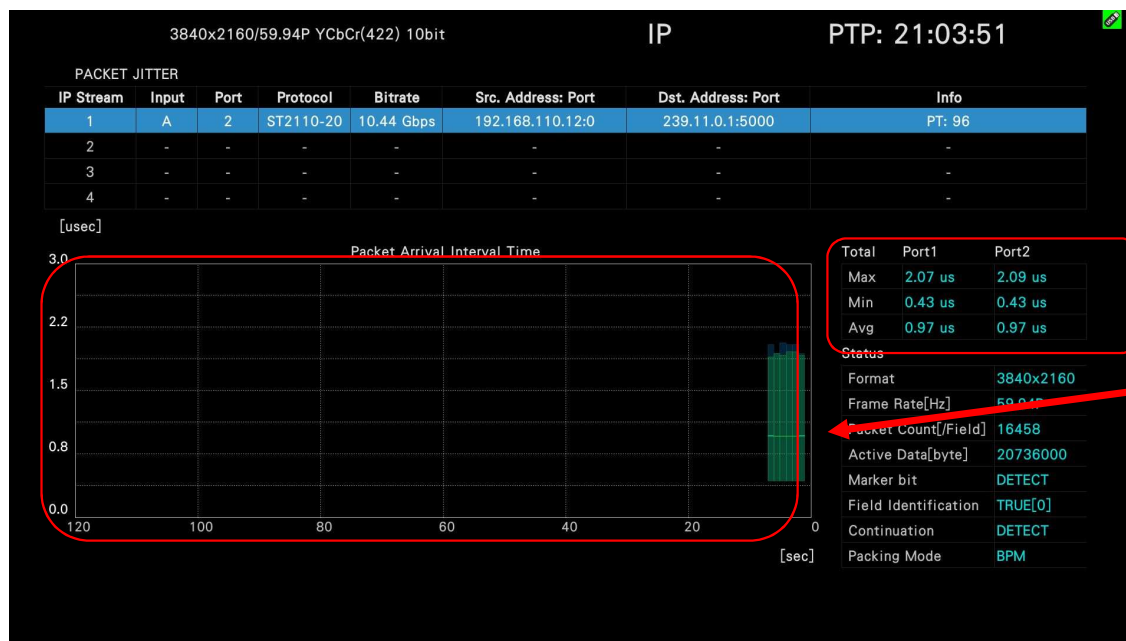
Inserts the format information of PayLoad ID into the output during IP / SDI conversion.

When OFF, the information is inserted if the PayLoad ID is inserted in ST2110-40.

5. Redundancy Measurement

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·1 PACKET JITTER

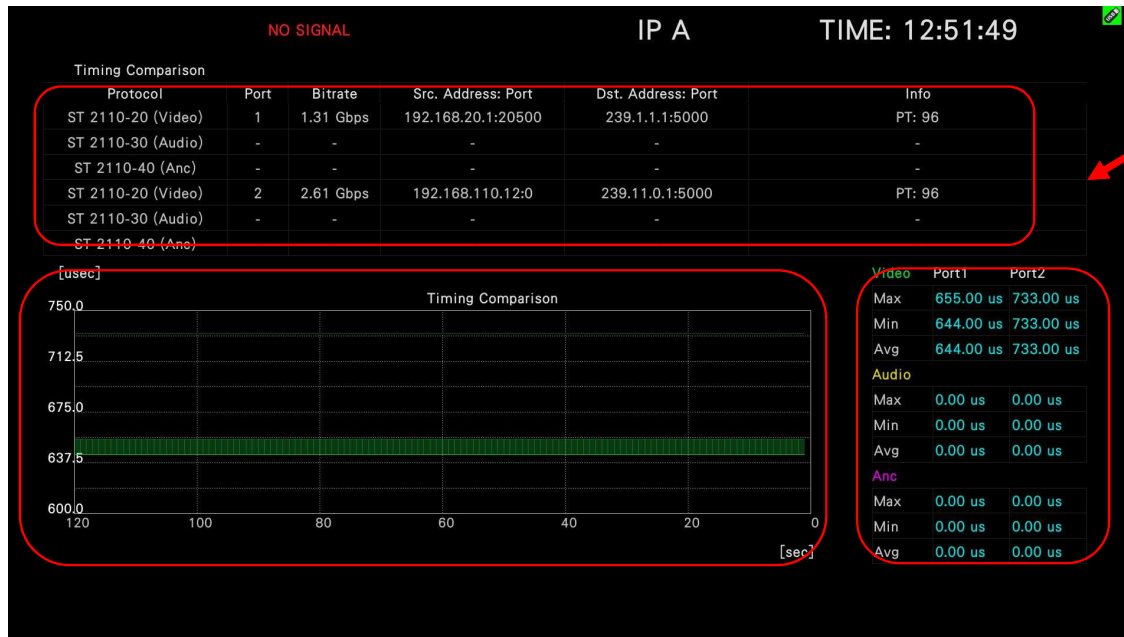


Displays the packet arrival interval of both ports 1/2.
Graph data can be switched at port 1/2 and displayed simultaneously.

5. Redundancy Measurement

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·3 TIMING COMPARISON

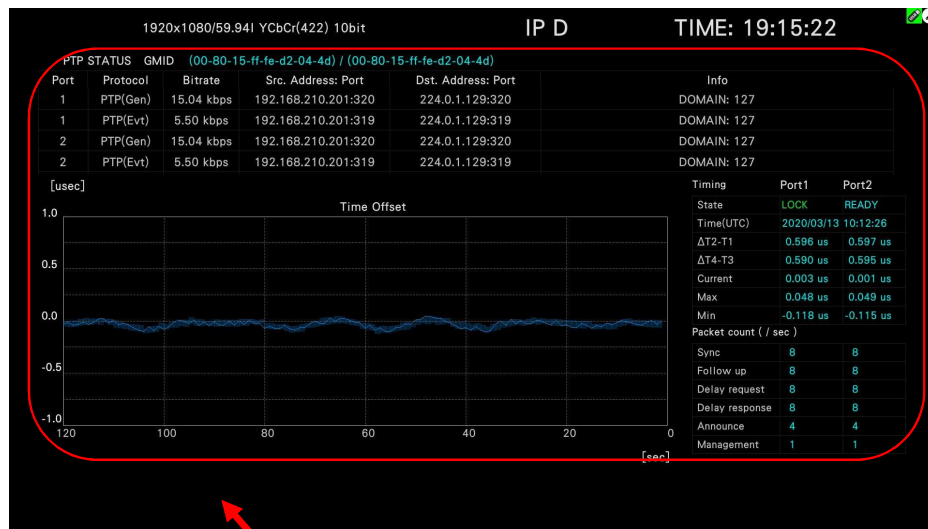


Displays the PTP-RTP timing comparison of both ports 1/2.

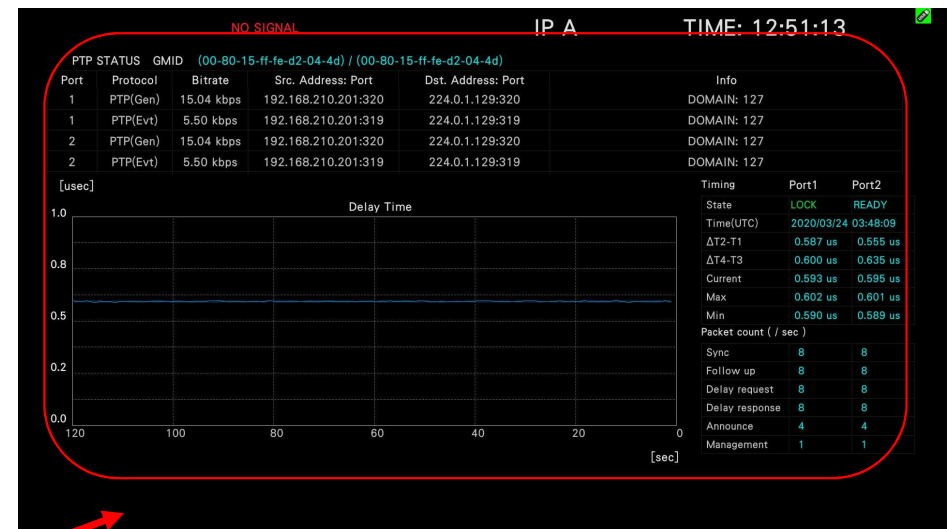
5. Redundancy Measurement

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·2 PTP



Displays PTP information for both ports 1/2.
Graphs can be displayed for both port selection and both.



MODE

DELAY : PTP delay time is displayed.
OFFSET : The offset time of PTP is displayed.
INFO : Displays GM information of PTP.

6. PTP Time Logging

Operation

SYS → F·2 SYSTEM SETUP → F·2 PREV TAB or F·3 NEXT TAB → CAPTURE&DISPLAY

The screenshot shows the 'CAPTURE&DISPLAY' menu with various settings. The 'Time' dropdown is set to 'PTP' and is highlighted with a red box. A red arrow points from the explanatory text on the right to this box.

GENERAL	CAPTURE&DISPLAY	NETWORK	SNMP	SER06(IP)	REMOTE	RS485	CAMERA ID	TALLY	OPERATION KEY	DATE&TIME
Capture										
Mode		Screen		File Type						
Signal Color		Cyan		☒ BMP ☒ BSG ☐ DPX ☐ TIFF ☐ FRM ☐ PCAP ☐ SDP						
				Transport Frame Number						
				☐ 1 Frame ☐ 16 Frames						
				PCAP Port (Port 1/2 Max 1MB, Ethernet Max10MB/60sec)						
				☐ Port 1(SFP) ☐ Port 2(SFP) ☐ Ethernet(RJ45)						
				PCAP store PTP (Max 4KB)						
				☐ Off ☐ On						
Information Display										
Format		☐ Off ☒ On								
Input		☐ Off ☒ On								
Icon		☐ Off ☒ On								
Error		☐ Off ☒ On								
Temperature Warning		☐ Off ☒ On								
Date		y/m/d								
Time		PTP		Time Zone Adjust		+9:00				

By setting Time to PTP, the event log and time display will be displayed in PTP time. Correct at the time set in TimeZone.

7. PTP Information

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·2 PTP

Displays the Grandmaster clock information obtained from the PTP announcement message.
The Grand Master is selected based on this information by the Best Master Clock Algorithm (BMCA).

1920x1080/59.94i YCbCr(422) 10bit IP D TIME: 19:15:08

Port	Protocol	Bitrate	Src. Address: Port	Dst. Address: Port	Info
1	PTP(Gen)	15.04 kbps	192.168.210.201:320	224.0.1.129:320	DOMAIN: 127
1	PTP(Evt)	5.50 kbps	192.168.210.201:319	224.0.1.129:319	DOMAIN: 127
2	PTP(Gen)	15.04 kbps	192.168.210.201:320	224.0.1.129:320	DOMAIN: 127
2	PTP(Evt)	5.50 kbps	192.168.210.201:319	224.0.1.129:319	DOMAIN: 127

Port1		Port2	
Name	Value	Name	Value
DomainNumber	127	DomainNumber	127
OriginTimestamp	0(sec) 0(nsec)	OriginTimestamp	0(sec) 0(nsec)
UTC Offset	37	UTC Offset	37
Priority1	1	Priority1	1
ClockClass	6	ClockClass	6
ClockAccuracy	<= 100ns	ClockAccuracy	<= 100ns
ClockVariance	15652	ClockVariance	15652
Priority2	1	Priority2	1
ClockIdentity	008015ffed2044d	ClockIdentity	008015ffed2044d
StepsRemoved	1	StepsRemoved	1
TimeSource	GPS	TimeSource	GPS

Timing	Port1	Port2
State	LOCK	READY
Time(UTC)	2020/03/13 10:12:12	
ΔT2-T1	0.528 us	0.533 us
ΔT4-T3	0.664 us	0.662 us
Current	-0.068 us	-0.065 us
Max	0.000 us	0.000 us
Min	0.000 us	0.000 us

Packet count (/ sec)		
Sync	8	8
Follow up	8	8
Delay request	8	8
Delay response	8	8
Announce	4	4
Management	1	1

originTimestamp : The value of the local time ± 1 of the origin clock of the announcement message is entered. Normally it will be 0.

UTC Offset : Indicates the UTC offset value of the time information.

Priority1 : Indicates the priority of the grand master clock in BMCA.

ClockClass : Indicates the degree of acquisition of the time source of the Grandmaster clock.

ClockAccuracy : Indicates the accuracy of the Grandmaster clock.

ClockVariance : Indicates the stability of the grand master clock.

Priority2 : Indicates the priority of the grand master clock in BMCA.

ClockIdentity : Indicates the ID of the grand master clock.

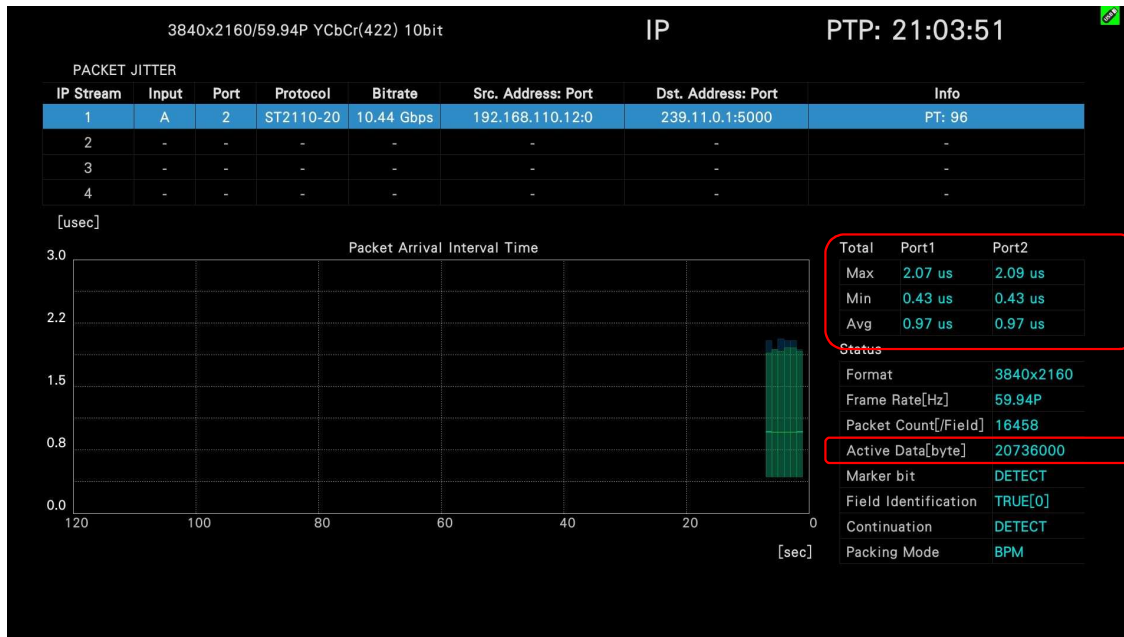
stepsRemoved : Indicates the number of communication paths for the local clock and the grand master clock.

timeSource : Indicates the time source of the grand master clock.

8. Packet Jitter Mode

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·1 PACKET JITTER



Displays the packet arrival interval of both ports 1/2.

Displays one frame of video data (byte)

MODE ※ Valid only when Type is ST2110

VIDEO ACTIVE: Displays the arrival interval of video packets excluding the interval between video frames.

VIDEO ALL: Displays the arrival interval of video packets including the interval between video frames.

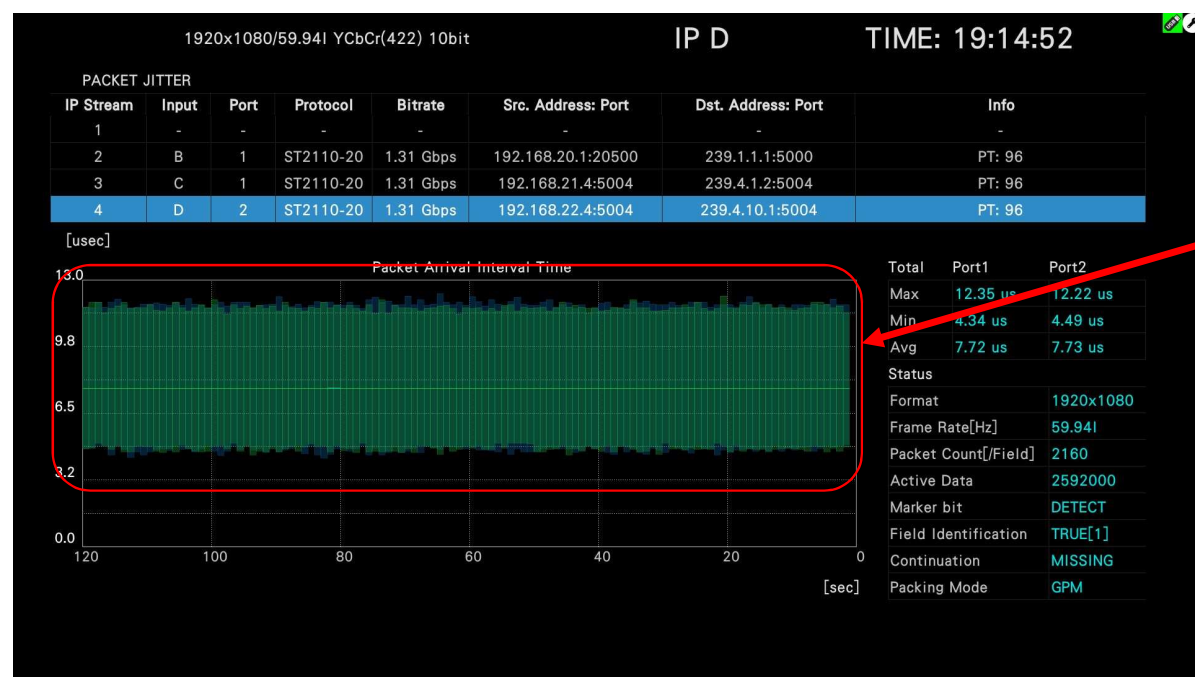
AUDIO: Displays the arrival interval of voice packets.

ANC: Displays the arrival interval of ANC packets.

9 . Get graph data (CSV)

Operation

STATUS → F·2 SDI / IP ANALYSIS → F·4 IP → F·2 IP MEAS → F·1 PACKET JITTER → F·4 CHAT SETUP → F·4 CHART STORE



Save the acquired graph data to USB in CSV format.

The data that can be acquired are the values of MAX, MIN, and AVG.

The time in the log data is the time when the chart was cleared. When PTP is selected in Time of SYSTEM SETUP, logging is performed at PTP time. Otherwise, the local time is applied.

✖ At startup, the log is in local time because it is not locked to PTP.