LV5600 / LV7600-SER05/06 New Function

Application Information

2020.4.2

About additional functions

Feature

- 1. SER06 buffer measurement 🛛 💥 ST2110 only, And SER06 only
- 2. SER32 Packet Error Insertion SER32 Packet Jitter Insertion SER32 Packet SER32 Packet Jitter Insertion SER32 Packet SER32 Packet
- 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 \rightarrow F7 : INITIALIZE \rightarrow F7 : FIRMWARE UPDATE \rightarrow 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 \rightarrow F7 : INITIALIZE \rightarrow F7 : FIRMWARE UPDATE \rightarrow F3 : UPDATE YES
- 5. Update start
- 6. Completed if no message prompting re-update is displayed.



Leader 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 Mesurement

Operation

 $\dot{STATUS} \rightarrow F \cdot 2 \text{ SDI} / \text{IP ANALYSIS} \rightarrow F \cdot 4 \text{ IP} \rightarrow F \cdot 2 \text{ IP MEAS} \rightarrow F \cdot 4 \text{ next menu} \rightarrow F \cdot 3 \text{ BUFFER}$

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.



2. Packet Emulation

Operation $SVS \rightarrow F \cdot 1$

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



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

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

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.

3. LipSync Test Pattern

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



4. PayLoad ID Insert

Operation

SYS \rightarrow F·1 SIGNAL IN OUT \rightarrow F·2 PREV TAB or F·3 NEXT TAB \rightarrow 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 📢
Type	ST2110 •						
Redundancy Mode	OFF	😴 ON	SDI O	ut PID Insert	ኛ OFF	ON	
IP Input	1						
IP Stream	1						
Video	VLAN ID						
	Source Address						
	Destination Address	239	11 1	0 1 C	Destination Port	0 5 0 0	
Audio							
	VLAN ID						
	Source Address						
	Destination Address						
ANC	VLAN ID						
	Source Address						
	Destination Address						

 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 Mesurement

Operation

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

PACKET	JITTER								
IP Stream	Input	Port	Protocol	Bitrate	Src. Address: Por	t Dst. Address: F	Port	Info	
			ST2110-20	10.44 Gbps	192.168.110.12:	239.11.0.1:50	00	PT: 96	
2									
3									
4									
[usec]									
0				Packet Arrival	Interval Time			Total Port1	Port2
								Max 2.07 us	2.09 us
								Min 0.43 us	0.43 us
2								Avg 0.97 us	0.97 us
								Status	
5								Format	3840x2160
								Frame Rate[Hz]	50.045
								Fucker Count[/Field]	16458
8								Active Data[byte]	20736000
								Marker bit	DETECT
0								Field Identification	TRUE[0]
120	1	00	80	6	0 40	20	0	Continuation	DETECT
							[sec]	Packing Mode	BPM

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

5. Redundancy Mesurement

Operation

 $\dot{STATUS} \rightarrow F \cdot 2 \text{ SDI} / \text{ IP ANALYSIS} \rightarrow F \cdot 4 \text{ IP} \rightarrow F \cdot 2 \text{ IP MEAS} \rightarrow F \cdot 3 \text{ TIMING COMPARISON}$

	NC	SIGNAL			IP A	TI	ME: 1	2:51:49	9	
Timing Comparison										
Protocol	Port	Bitrate	Src. Address: P	ort Dst. A	ddress: Port		Inf	0		
ST 2110-20 (Video)		1.31 Gbps	192.168.20.1:20	500 239.	1.1.1:5000		PT:	96		
ST 2110-30 (Audio)										
ST 2110-40 (Anc)										
ST 2110-20 (Video)	2	2.61 Gbps	192.168.110.1	2:0 239.1	1.0.1:5000		PT:	96		
ST 2110-30 (Audio)										
ST 2110 40 (Anc)										
[usec]							Video	Port1	Port2	
i0 0			Timing Comp	arison			Max	655.00 us	733.00 us	
							Min	644.00 us	733.00 us	
25							Avg	644.00 us	733.00 us	
							Audio			
5.0							Max	0.00 us	0.00 us	
							Min	0.00 us	0.00 us	
7.5							Avg	0.00 us	0.00 us	
0.0							Max	0.00 us	0.00 us	
120 100		80	60	40	20	0	Min	0.00 us	0.00 us	

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

5. Redundancy Mesurement

Operation STATUS \rightarrow F·2 SDI / IP ANALYSIS \rightarrow F·4 IP \rightarrow F·2 IP MEAS \rightarrow F·2 PTP

PTP S	STATUS GM	ID (00-80-19	5-ff-fe-d2-04-4d) / (00-80	15-ff-fe-d2-04-4d)						
Port	Protocol	Bitrate	Src. Address: Port	Dst. Address: Port			Info			
	PTP(Gen)	15.04 kbps	192.168.210.201:320	224.0.1.129:320		DC	MAIN: 127			
	PTP(Evt)	5.50 kbps	192 168 210 201:319	224.0.1.129:319		DC	MAIN: 127			
	PTP(Gen)	15.04 kbns	192 168 210 201-320	224.0.1.129.320		DC	MAIN: 127			
	PTP(Evt)	5 50 kbps	192 168 210 201-319	224.0.1.129:319		DC	MAIN: 127			
~		0.00 1000					Timing	Port1	Port?	
isecj				en e			Ctata	POILI	POILZ	
			Time Of	fset			Time(UTC)	2020/03/13	10-12-26	
							AT2-T1	0.596 us	0.597 us	
							ΔT4-T3	0.590 us	0.595 us	
							Current	0.003 us	0.001 us	
							Max	0.048 us	0.049 us	
							Min	-0.118 us	-0.115 us	
				and the second second			Packet count (/ s	ec)		
							Sync			
							Follow up			
							Delay request			
							Delay response			
20	1	00	80 60	40	20		Announce			
						[000]	Management			

Displays PTP information for both ports 1/2.

Graphs can be displayed for both port selection and both.

PTP S	STATUS GM	ID (00-80-15	5-ff-fe-d2-04-4d) / (00-	80-15-ff-fe-d2	-04-4d)					
Port	Protocol	Bitrate	Src. Address: Port	Dst. A	ddress: Port			Info		
	PTP(Gen)	15.04 kbps	192.168.210.201:320	0 224.0	.1.129:320		D	OMAIN: 127		
	PTP(Evt)	5.50 kbps	192.168.210.201:31	9 224.0	.1.129:319			OMAIN: 127		
	PTP(Gen)	15.04 kbps	192.168.210.201:320	0 224.0	.1.129:320		D	OMAIN: 127		
	PTP(Evt)	5.50 kbps	192.168.210.201:31	9 224.0	.1.129:319		E	OMAIN: 127		
[usec]								Timing	Port1	Port2
•			Delay	Time				State		READY
								Time(UTC)	2020/03/24	03:48:09
								∆T2-T1	0.587 us	0.555 us
.8								∆т4-тз	0.600 us	0.635 us
								Current	0.593 us	0.595 us
								Max	0.602 us	0.601 us
.5								Min	0.590 us	0.589 us
								Packet count (/ s	sec)	
								Sync		
2								Follow up		
								Delay request		
•								Delay response		
120		00	80 6	0	40	20	0	Announce		
								Management		
							[sec]			

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 \rightarrow F·2 SYSTEM SETUP \rightarrow F·2 PREV TAB or F·3 NEXT TAB \rightarrow CAPTURE&DISPLAY

GENERA	L CAPTURE&DISPLAY	NETWORK SNMP	SER06(IP)	REMOTE RS485	CAMERA ID	TALLY (OPERATION KEY	DATE&TIME
	Capture			File Type				
	Mode	Screen	V	BMP BSG	R DPX R TI	FF 🕱 FRM	PCAP SDF	
	Signal Color	Cyan	¥	Transport Frame N	lumber ———			
				📕 1 Frame	🛤 16 Frames			
				PCAP Port (Port 1/	/2 Max 1MB, Eth	ernet Max10)MB/60sec)	
				■ Port 1(SFP)	R Port 2(SFP)	Eth		
				PCAP store PTP (N	Max 4KB) ———			
				■ Off	R On			
	Information Display							
	Format	■ Off	ኛ On					
	Input	■ Off	😴 On					
	Icon	Cff	ኛ On					
	Error	Cff	😴 On					
	Temperature Warning	■ Off	😴 On					
	Date	y/m/d						
	Time	PTP •		Time Zone Ac	djust +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 \rightarrow F·2 SDI / IP ANALYSIS \rightarrow F·4 IP \rightarrow F·2 IP MEAS \rightarrow 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).

		1920x1080/59.9	41 YCbCr(422)	10bit		IF	P D	TIME: 19:	15:08	3
PTP	STATUS	GMID (00-80-1	5-ff-fe-d2-04-4d)	/ (00-80-1	5-ff-fe-d2-0	4-4d)				
Port	Protoc	ol Bitrate	Src. Address	Port	Dst. Add	ress: Port		Info		
	PTP(Ge	n) 15.04 kbps	192.168.210.2	01:320	224.0.1	129:320		DOMAIN: 127		
	PTP(Ev	rt) 5.50 kbps	192.168.210.2	01:319	224.0.1	129:319		DOMAIN: 127		
	PTP(Ge	en) 15.04 kbps	192.168.210.2	01:320	224.0.1	.129:320		DOMAIN: 127		
	PTP(Ev	rt) 5.50 kbps	192.168.210.2	01:319	224.0.1	.129:319		DOMAIN: 127		
				PTP Info				Timing	Port1	Port2
		Port1				Port2		State	LOCK	READY
No	mo	Val	110		Name		Value	Time(UTC)	2020/03/1	3 10:12:12
Domain	Number	127		Doma	inNumber	127		ΔΤ2-Τ1	0.528 us	0.533 us
OriginTi	mestamp	O(sec) O(nsec)		Origi	nTimestamp	O(sec) O(nse	c)	ΔT4-T3	0.664 us	0.662 us
	eat	37		UTC (Offeat	37	o,	Current	-0.068 us	-0.065 us
Drioritu 1	361			Driori	+1			Max	0.000 us	0.000 us
				FIIOII	C)			Min	0.000 us	0.000 us
ClockCla	ass	6		Clock	Class	6		Packet count (/	sec)	
ClockAc	curacy	<= 100ns		Clock	Accuracy	<= 100ns		Sync		
ClockVa	riance	15652		Clock	Variance	15652		Follow up		
Priority2	2			Priori	ty2			Delay request		
ClockIde	entity	008015fffed2044	d	Clock	Identity	008015fffed	2044d	Delay response		
StepsRe	moved			Steps	Removed			Announce		
TimeSou	Irce	GPS		Time	Source	GPS		Management		

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.

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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 \rightarrow F·2 SDI / IP ANALYSIS \rightarrow F·4 IP \rightarrow F·2 IP MEAS \rightarrow F·1 PACKET JITTER



AUDIO: Displays the arrival interval of voice packets.

ANC: Displays the arrival interval of ANC packets.

9. Get graph data (CSV)

Operation

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

	192	0x1080	/59.94I YCbC	cr(422) 10bit		IP D	TIME	E: 19:14:	52
PACKET	JITTER								
IP Stream	Input	Port	Protocol	Bitrate	Src. Address: Port	Dst. Address: Port		Info	
2	В		ST2110-20	1.31 Gbps	192.168.20.1:20500	239.1.1.1:5000		PT: 96	
3	С		ST2110-20	1.31 Gbps	192.168.21.4:5004	239.4.1.2:5004		PT: 96	
	D		ST2110-20	1.31 Gbps	192.168.22.4:5004	239.4.10.1:5004		PT: 96	
[usec]									
20				Packet Arrival	Interval Time		Total	Port1	Port2
3.0				Packet Anival	Interval Time		Total Max	Port1 12.35 us	Port2 12.22 us
3.0		r, dinal		Packet Anival	Interval Time	a for the second se	Total Max Min	Port1 12.35 us 4.34 us	Port2 12.22 us 4.49 us
8	an Coltan ay an an ta ta ta ta ta ta			Packet Anival	Interval Time		Total Max Min Avg	Port1 12.35 us 4.34 us 7.72 us	Port2 12.22 us 4.49 us 7.73 us
8				Packet Arrivai	Interval Time		Total Max Min Avg Statu	Port1 12.35 us 4.34 us 7.72 us s	Port2 12.22 us 4.49 us 7.73 us
8				Packet Arrivat	interval Time		Total Max Min Avg Statu Form	Port1 12.35 us 4.34 us 7.72 us s at	Port2 12.22 us 4.49 us 7.73 us 1920x1080
8 5				Packet Arrivat	interval Time		Total Max Min Avg Statu Form Fram	Port1 12.35 µs 4.34 µs 7.72 µs s at e Rate[Hz]	Port2 12.22 us 4.49 us 7.73 us 1920x1080 59.941
5.0 8				Packet Anival	interval Time		Total Max Min Avg Statu Form Fram Packe	Port1 12.35 us 4.34 us 7.72 us s at e Rate[Hz] et Count[/Field]	Port2 12.22 us 4.49 us 7.73 us 1920x1080 59.941 2160
5 2				Packet Aniva	interval Time		Total Max Min Avg Statu Form Fram Packe Activ	Port1 12.35 us 4.34 us 7.72 us s at e Rate[Hz] et Count[/Field] re Data	Port2 12.22 us 4.49 us 7.73 us 1920x1080 59.941 2160 2592000
3.0 8 5 2				Packet Anival	interval Time		Total Max Min Avg Statu Form Fram Packa Activ Mark	Port1 12.35 us 4.34 us 7.72 us s at e Rate[Hz] et Count[/Field] re Data er bit	Port2 12.22 us 4.49 us 7.73 us 1920×1080 59.941 2160 2592000 DETECT
3.0 8 5 2					interval Time		Total Max Min Avg Statu Form Fram Packu Activ Mark Field	Port1 12.35 us 4.34 us 7.72 us s at e Rate[Hz] et Count[/Field] re Data er bit Identification	Port2 12.22 us 4.49 us 7.73 us 1920×1080 59.941 2160 2592000 DETECT TRUE[1]
8.0 8.5 2.0 120			80	Packet Anival	-interval Time	20	Total Max Min Avg Statu Form Fram Packu Activ Mark Field 0 Cont	Port1 12.35 us 4.34 us 7.72 us s at e Rate[Hz] et Count[/Field] re Data er bit I dentification inuation	Port2 12.22 us 4.49 us 7.73 us 1920x1080 59.941 2160 2592000 DETECT TRUE[1] MISSING

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.

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