FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

FA-9600 Command

Version 2.1 - Higher

FOR-A COMPANY LIMITED

Table of Contents

1. Communication Settings

FA-9600 units can be controlled using dedicated commands over LAN.
Dynamic Range Control / Color Converter and Audio menu settings can be changed by these commands.

1-1. Communication Method

Communication Interface
Ethernet: IEEE802.3u/ab (100BASE-TX / 1000BASE-T)

Control Command
Command Devices send control commands to FA-9600 using TCP packets.
(See Sec 3 “Command Format” for details on commands and its format)
Response to Command (FA-9600)
FA-9600 sends “ACK” after properly receiving a command, or an error message in other cases using TCP packets. (See Sec. 3-2 “Command Response.”)

Destination Address
FA-9600 IP address: **192.168.0.10** (default) (Use the current FA-9600 IP address.))
Connection Timeout (Keep-Alive Idle)
10-180 sec (default: 120 sec) (See the next page for changing setting.)
No response comes back before the timeout limit while establishing the TCP connection with an FA-9600, the command transmitter waits 750 seconds while detecting packets. If no packets are still received, the connection is forced to close.

Number of Command Connections
A single FA-9600 unit can simultaneously receive commands from up to two control points.

Status Request
Command Devices send status request messages (TCP) to FA-9600.
Response to Status Request (FA-9600)
FA-9600 sends status messages (UDP) in response to request. (See Sec. 7 “Status Messages from FA-9600)

Status Report (FA-9600)
When the FA-9600 status or settings change, FA-9600 sends a status report to two destinations (UDP). Status report messages have the same syntax as those for status response messages.

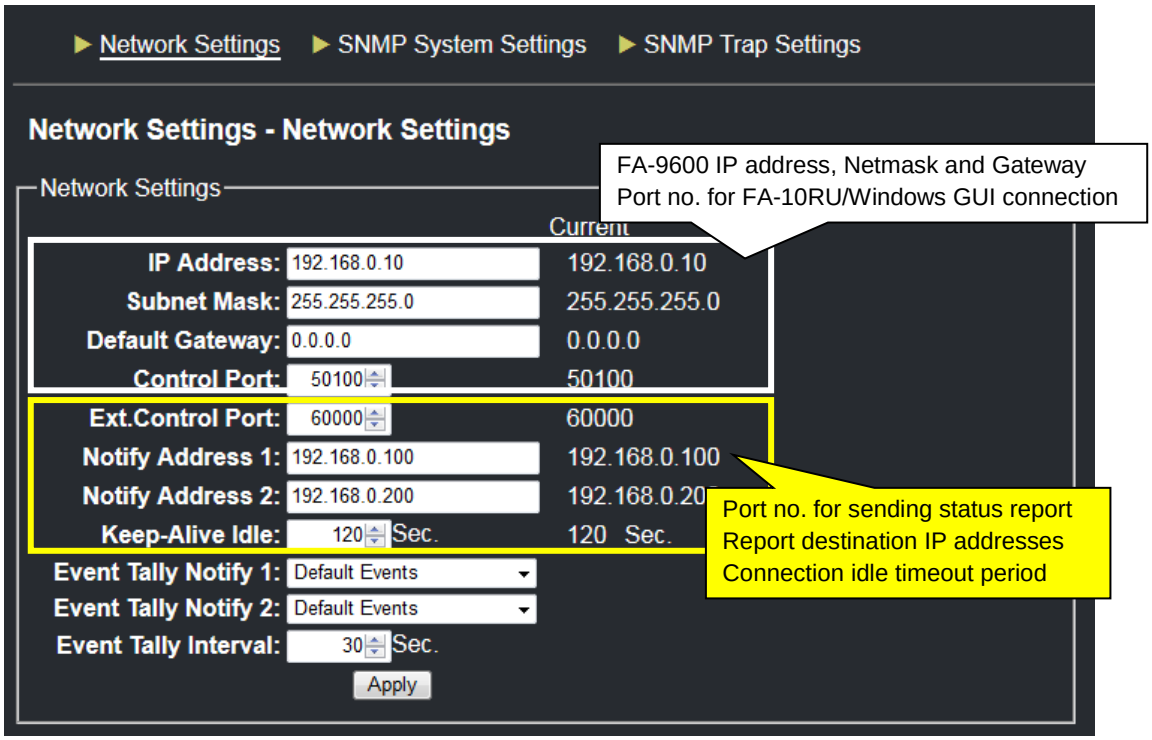
Destination Address
Destination 1: **0. 0. 0. 0** (default) (To change the address, see next page.)
Destination 2: **0. 0. 0. 0** (default) (To change the address, see next page.))
UDP port: **6000** (default) (To change the number, see the nest page.))

- Two destinations are defined in the Web GUI - Network Settings tab. (See next page)
- Change targets are parameter values that can be changed by commands (excluding event control) and input/output formats.
- The time intervals for detecting changes are 500 to 1000 msec (depending on the software performance.)

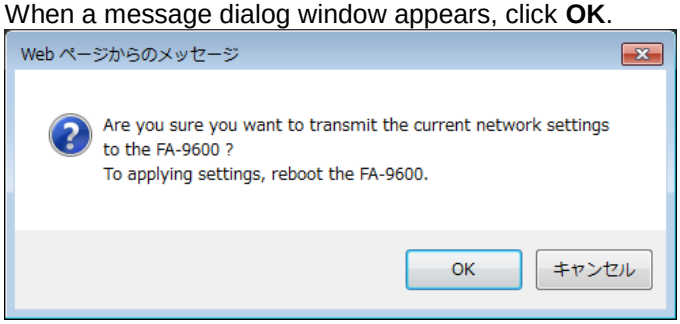
1-2. Changing Status Report Destination Addresses

Whenever the FA-9600 status changes, FA-9600 sends a status report to two destinations (UDP). These destination addresses and port number can be changed as shown below, as needed.

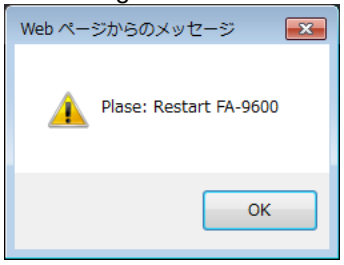
1) Refer to FA-9600 Operation Manual to connect to FA-9600 through Web GUI.
2) Select the **Network Settings** tab in the Web GUI. A screen as shown below opens.



3) Set two destination addresses under **Notify Address 1** and **2**.
4) Set the port number under **Ext. Control Port** which is shared by the two ports.
5) Set the idle timeout period under **Keep-Alive Idle**.
6) Click **Apply**.
7) When a message dialog window appears, click **OK**.



8) When a reconfirmation dialog appears, click **OK**.
The changes are enabled after restarting FA-9600.



2. Command Flow Examples

2-1. Checking FA-9600 Start-up

1) Command Device issues a Power On command to Command Device. (See Sec. 6-1 " Power On")
2) FA-9600 sends "ACK" to Command Device. (See Sec. 3-2. "Command Response")

Start command control with this request command and send the next command after receiving "ACK."

2-2. Requesting FA-9600 Video Status

1) Command Device issues a status request to FA-9600. (See Sec. 6-4 "Video Status Request.")
2) FA-9600 sends "ACK" to Command Device.
3) FA-9600 send a status message in response to the command. (See Sec. 7-1 "Video Status ")
4) Command Device sends "ACK" to FA-9600.

Use this flow example whenever requesting FA-9600 status after restart.

2-3. Changing Audio Gain Settings

1) Command Device issues an Audio Gain Setting command to FA-9600. (See Sec. 5-4 "Audio Gain")
2) FA-9600 sends "ACK" to Command Device.

Send the next command after receiving "ACK" from FA-9600.

2-4. Reporting FA-9600 Status Change

1) FA-9600 issues a status message to two specified destinations. (See Sec. 7 "Status Messages from FA-9600")
2) The destination devices send "ACK" to FA-9600.

If no "ACK" returns, FA-9600 re-sends the status message up to three times.

3. Command Format

3-1. Setting Commands

◆ **Command Example**

<Command code>,<ID code>,<Item code>,<Value>[CR][LF]

Commands sent from Command Devices to FA-9600 are composed of 4 variables, using commas as a separator as shown above.

< >	Denotes a command variable in which an actual value is entered.
Command code	Denotes a command string.
ID code	Denotes an FA-9600 menu category. (See next page)
Item code	Represents an FA-9600 menu parameter.
Value	Represents an FA-9600 menu parameter value.
[CR][LF]	Denotes a newline character to be added at the end of Command statements.
[SP]	Denotes a space character. (Note that adding unnecessary spaces cause command errors)

Only ASCII characters are available (Case-sensitive).

◆ **Command Example**

Dynamic Range Conv,FS1,Gamma Curve Enable,1[CR][LF]
(Setting Command that enables the FS1 Dynamic Range / Color Space conversion.)

See Secs 4 and 5 for each Setting Command details.
See Sec. 6 for Status Request and other command details

3-2. Command Response

◆ **Normal Response**
Return message: ACK[CR][LF]

◆ **Error Response**
Any of the following error messages is returned if a command is not properly received.
Return message: ERR<Error code>[CR][LF]

Error code	Description
01	Command error
02	ID code error
03	Item code error
04	Value error
97	Setting error
98	Number of items error
99	Timeout error (ACK[CR][LF] not returned within time limit)

3-3. ID Code

The following values are used for <ID code>.

Value	Description
FS1:	FS1 control
FS2	FS2 control
EMB1	FS1 embedded audio control
EMB2	FS2 embedded audio control
AES	AES (digital audio) control
COM	FS1 and FS2, or EMB1 and EMB2 shared control
ADLY G1	Audio delay group 1 (Ch1-Ch16)
ADLY G2	Audio delay group 2 (Ch17-Ch32)
SlotB	Option slot B that represents FA-96AES-UBL.

3-4. Video Setting Command List

Add [CR][LF] at the end of commands.
See Sec. 4 “Video Setting Commands.”
*1 Available commands when FA-9600 is in 3D LUT mode.
*2 Available commands when **HLG BT.2100** is set for input or output gamma curve.

No.	Command statement	*1	*2	Refer to
1	Dynamic Range CONV,<ID code>,Gamma Curve Enable,<Value>	FS1		4-1
2	Dynamic Range CONV,<ID code>,EOTF DeGamma,<Value>			4-2
3	Color Space CONV,<ID code>,In Color Space,<Value>			4-3
4	Dynamic Range CONV,<ID code>,OETF Gamma,<Value>			4-4
5	Color Space CONV,<ID code>,Out Color Space,<Value>			4-5
6	Color Space CONV,<ID code>,DRC 3DLUT,<Value>	✓		4-6
7	Dynamic Range CONV,<ID code>,Dynamic Range Gain,<Value>			4-7
8	Dynamic Range CONV,<ID code>,SDR Gain,<Value>			4-8
9	Dynamic Range CONV,<ID code>,Simul Mode,<Value>			4-9
10	Dynamic Range CONV,<ID code>,Convert Mode,<Value>		✓	4-10
11	Dynamic Range CONV,<ID code>,OOTF IN Mode,<Value>		✓	4-11
12	Dynamic Range CONV,<ID code>,OOTF IN System Gamma,<Value>		✓	4-12
13	Dynamic Range CONV,<ID code>,OOTF IN Display Peak,<Value>		✓	4-13
14	Dynamic Range CONV,<ID code>,OOTF IN Display Black,<Value>		✓	4-14
15	Dynamic Range CONV,<ID code>,OOTF OUT Mode,<Value>		✓	4-15
16	Dynamic Range CONV,<ID code>,OOTF OUT System Gamma,<Value>		✓	4-16
17	Dynamic Range CONV,<ID code>,OOTF OUT Display Peak,<Value>		✓	4-17
18	Dynamic Range CONV,<ID code>,OOTF OUT Display Black,<Value>		✓	4-18
19	Dynamic Range CONV,<ID code>,OOTF FOR SR-Live,<Value>		✓	4-19
20	Knee Clip,<ID code>,White Clip Enable,<Value>			4-20
21	Knee Clip,<ID code>,Knee Type,<Value>			4-21
22	Knee Clip,<ID code>,White Clip,<Value>			4-22
23	Knee Clip,<ID code>,Knee Slop,<Value>			4-23
24	Knee Clip,<ID code>,Knee Point,<Value>			4-24
25	Knee Clip,<ID code>,Knee Saturation Enable,<Value>			4-25

26	Knee Clip,<ID code>,Knee Saturation Level,<Value>			4-26
27	Knee Clip,<ID code>,Black Clip Enable,<Value>			4-27
28	Knee Clip,<ID code>,Black Clip,<Value>			4-28

3-5. Audio Setting Command List

Add [CR][LF] at the end of commands.
See Sec. 5 “Audio Commands.
*1 Available commands when FA-9600 is in 3D LUT mode.
*2 Commands available with96AES-UBL option

No.	Command statement	*1	*2	Refer to
24	Audio Polarity,<ID code>,<Item code>,<Value>	EMB1, AES		5-1
25	Audio MAP,<ID code>,<Item code>,<Value>	EMB1, AES		5-2
26	Audio Gain,<ID code>,Master[SP]Gain,<Value>	EMB1, AES		5-3
27	Audio Gain,<ID code>,<Item code>,<Value>	EMB1, AES		5-4
28	Audio Delay,<ID code>,Master,<Value>	✓		5-5
29	Audio Delay,<ID code>,<Item code>,<Value>	✓		5-6
30	Audio Delay,<ID code>,Delay[SP]Adj[SP]FS,<Value>	✓		5-7
31	FA-96AESUBL,SlotB,<Item code>,<Value>[	✓	✓	5-8
32	FA-96AESUBL,SlotB,<Item code>,<Value>	✓	✓	5-9
33	FA-96AESUBL,SlotB,Master Gain,<Value>	✓	✓	5-10
34	FA-96AESUBL,SlotB,<Item code>,<Value>	✓	✓	5-11

No. 31-34 are available with FA-96AES-UBL option card.

3-6. Other Command List

Add [CR][LF] at the end of commands.
See Sec. 6 “Other Commands.”
No. 41 is available with FA-96AES-UBL option card.

No.	Command statement	Refer to
35	PowerOn,COM,CHK,1	6-1
36	Event,COM,Load,<Value>	6-2
37	Event,COM,Save,<Value>	6-3
38	Status1,<ID code>,Get,0	6-4
39	Status2,<ID code>,Get,0	6-5
40	Status3,<ID code>,Get,0	6-6
41	Status4,SlotB,Get,0	6-7

4. Video Setting Commands

4-1. Dynamic Range, Color Space and 3D LUT Conversions

Command statement:

Dynamic Range CONV,<ID code>**,Gamma Curve Enable,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0	Bypass: Avoids the Dynamic Range / Color Space process.
1	Operate: Performs the Dynamic Range/Color Space processing.

* Only FS1 is enabled when FA-9600 is in 3D-LUT mode.

* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-2. EOTF DeGamma

Command statement:

Dynamic Range CONV,<ID code>**,EOTF DeGamma,**<Value>**[CR][LF]**

ID code
FS1
FS2

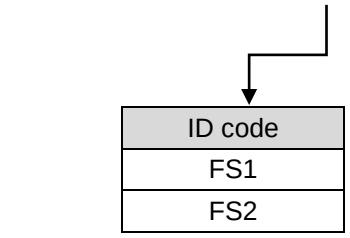
Value	FA-9600 setting
1	U01: SDR 2.2 BT.1886
2	U02: SDR 2.4 BT.1886
3	U03: HLG BT.2100
4	U04: HLG (RGB SG1.2)
5	U05: HLG (RGB SG1.4)
6	U06: ST 2084 (PQ)
7	U07: SDR 2.2 BT.709
8	U08: S-Log3
9	U09: Canon Log 2
10	U10: SDR 2.4 BT.1886
11	S-Log3-Live

* This command is disabled when FA-9600 is in 3D-LUT mode.

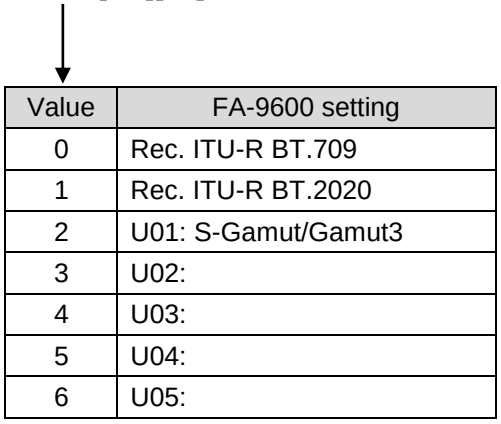
* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-3. In Color Space

Command statement:
Color Space CONV,<ID code>**,In Color Space,**<Value>**[CR][LF]**



ID code
FS1
FS2

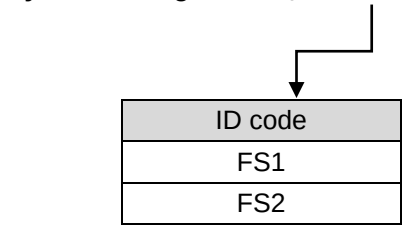


Value	FA-9600 setting
0	Rec. ITU-R BT.709
1	Rec. ITU-R BT.2020
2	U01: S-Gamut/Gamut3
3	U02:
4	U03:
5	U04:
6	U05:

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-4. OETF Gamma

Command statement:
Dynamic Range CONV,<ID code>**,OETF Gamma,**<Value>**[CR][LF]**



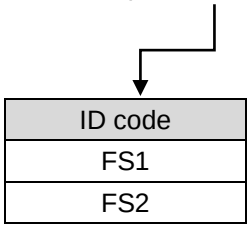
ID code
FS1
FS2

Value	FA-9600 setting
1	U01: SDR 2.2 BT.1886
2	U02: SDR 2.4 BT.1886
3	U03: HLG BT.2100
4	U04: HLG (RGB SG1.2)
5	U05: HLG (RGB SG1.4)
6	U06: ST 2084 (PQ)
7	U07: SDR 2.2 BT.709
8	U08: S-Log3
9	U09: Canon Log 2
10	U10: SDR 2.4 BT.1886
11	S-Log3-Live

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-5. Out Color Space

Command statement:
Color Space CONV,<ID code>**,Out Color Space,**<Value>**[CR][LF]**



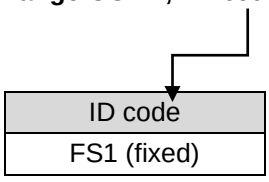
ID code
FS1
FS2

Value	FA-9600 setting
0	Rec. ITU-R BT.709
1	Rec. ITU-R BT.2020
2	U01: S-Gamut/Gamut3
3	U02
4	U03
5	U04
6	U05

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-6. 3D-LUT Data

Command statement:
Dynamic Range CONV,<ID code>**,DRC 3DLUT,**<Value>**[CR][LF]**



ID code
FS1 (fixed)

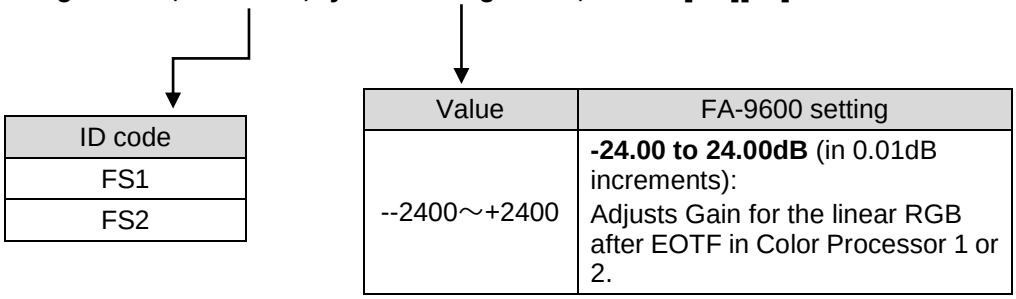
Value	FA-9600 setting
1	U01: HLG >> 709
2	U02: 709 >> HLG
3	U03: HLG >> 1886
4	U04: 1886 >> HLG
5	U05: FOR-A (1)
6	U06: FOR-A (2)
7	U07: FOR-A (3)
8	U08: Linear
9	U09: Linear
10	U10: Linear 6
11	HLGLive >> 709
12	709 >> HLGLive
13	SR-Live >> HLG

* This command is enabled when FA-9600 is in 3D-LUT mode.
* See “INPUT / OUTPUT GAMMA/COLOR (UHD & HD)” in FA-9600 Operation Manual.

4-7. Gain Adjustment

Command statement:

Dynamic Range CONV,<ID code>**,Dynamic Range Gain,**<Value>**[CR][LF]**



ID code
FS1
FS2

Value	FA-9600 setting
--2400～+2400	**-24.00 to 24.00dB** (in 0.01dB increments): Adjusts Gain for the linear RGB after EOTF in Color Processor 1 or 2.

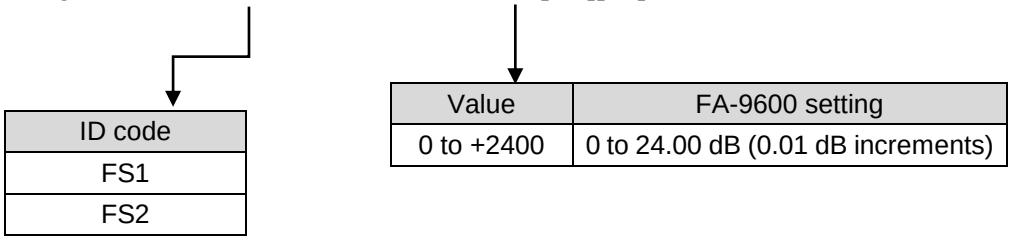
* This command is disabled when FA-9600 is in 3D-LUT mode.

* See “DYNAMIC RANGE GAIN CONTROL” in FA-9600 Operation Manual.

4-8. SDR Gain Adjustment

Command statement:

Dynamic Range CONV,<ID code>**,SDR Gain,**<Value>**[CR][LF]**



ID code
FS1
FS2

Value	FA-9600 setting
0 to +2400	0 to 24.00 dB (0.01 dB increments)

* This command is disabled when FA-9600 is in 3D-LUT mode.

* See “DYNAMIC RANGE GAIN CONTROL” in FA-9600 Operation Manual.

4-9. Gain Simultaneous Mode

Command statement:

Dynamic Range CONV,COM,Simul Mode,<Value>**[CR][LF]**

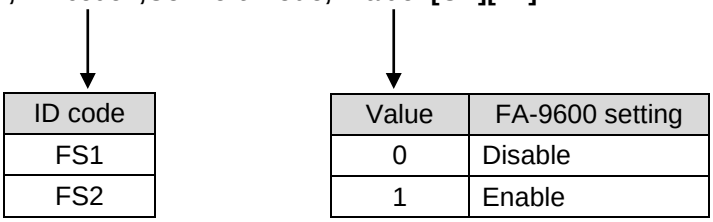
Value	FA-9600 setting
0	Disable
1	Enable

* This command is disabled when FA-9600 is in 3D-LUT mode.

* See “DYNAMIC RANGE GAIN CONTROL” in FA-9600 Operation Manual.

4-10. OOTF for HLG Mode

Command statement:
Dynamic Range CONV,<ID code>**,Convert Mode,**<Value>**[CR][LF]**



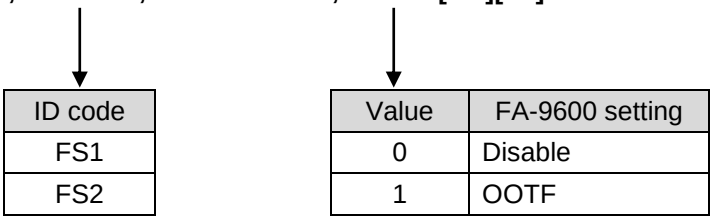
ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Enable

* This command is available when **Input or Output Gamma Curve** is set to "**HLG-BT.2100**".
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-11. OOTF IN for HLG

Command statement:
Dynamic Range CONV,<ID code>**,OOTF IN Mode,**<Value>**[CR][LF]**



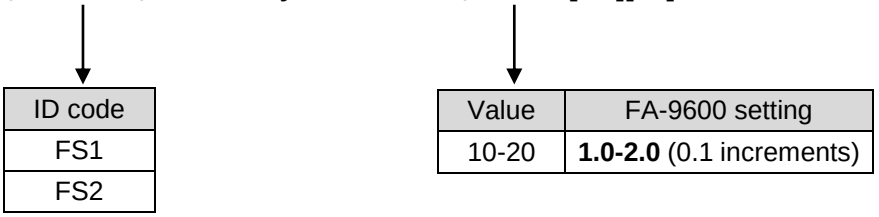
ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	OOTF

* This command is available when "**OOTF for HLG Mode**" is enabled.
  (See 4-10. "OOTF for HLG Mode.")
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-12. OOTF IN System Gamma for HLG

Command statement:
Dynamic Range CONV,<ID code>**,OOTF IN System Gamma,**<Value>**[CR][LF]**



ID code
FS1
FS2

Value	FA-9600 setting
10-20	**1.0-2.0** (0.1 increments)

* This command is enabled when "**OOTF IN for HLG**" is set to "**OOTF**."
  (See 4-11. "OOTF IN for HLG.")
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-13. OOTF IN Display Peak for HLG

Command statement:

Dynamic Range CONV,<ID code>**,OOTF IN Display Peak,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
100-10000	100-10,000 cd/m2 (in100 increments) Sets the maximum luminance peak for Display Light.

* This command is enabled when "**OOTF IN for HLG**" is set to "**OOTF**."
(See 4-11. "OOTF IN for HLG.")

* This command is disabled when FA-9600 is in 3D-LUT mode.

* See "OOTF for HLG" in FA-9600 Operation Manual.

4-14. OOTF IN Display Black for HLG

Command statement:

Dynamic Range CONV,<ID code>**,OOTF IN Display Black,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0-100	**0-100 cd/m2** (in 10 increments) Sets the minimum luminance peak for Display Light.

* This command is enabled when "**OOTF IN for HLG**" is set to "**OOTF**."
(See 4-11. "OOTF IN for HLG.")

* This command is disabled when FA-9600 is in 3D-LUT mode.

* See "OOTF for HLG" in FA-9600 Operation Manual.

4-15. OOTF OUT for HLG

Command statement:

Dynamic Range CONV,<<ID code>>**,OOTF OUT Mode,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Inverse OOTF

* This command is enabled when "**OOTF for HLG Mode**" is enabled.
(See 4-10. "OOTF for HLG Mode.")

* This command is disabled when FA-9600 is in 3D-LUT mode.

* See "OOTF for HLG" in FA-9600 Operation Manual.

4-16. OOTF OUT System Gamma for HLG

Command statement:
Dynamic Range CONV,<ID code>**,OOTF OUT System Gamma,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
10-20	**1.0-2.0** (in 0.1 increments)

* This command is enabled when "**OOTF OUT for HLG**" is set to "**Inverse OOTF**." (See 4-15. "OOTF OUT for HLG.")
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-17. OOTF OUT Display Peak for HLG

Command statement:
Dynamic Range CONV,<ID code>**,OOTF OUT Display Peak,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
100-10000	**100-10,000 cd/m2** (in 100 increments) Sets the maximum luminance peak for Display Light.

* This command is enabled when "**OOTF OUT for HLG**" is set to "**Inverse OOTF**." (See 4-15. "OOTF OUT for HLG.")
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-18. OOTF OUT Display Black for HLG

Command statement:
Dynamic Range CONV,<ID code>**,OOTF OUT Display Black,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0-100	**0-100 cd/m2** (in 10 increments) Sets the minimum luminance peak for Display Light.

* This command is enabled when "**OOTF OUT for HLG**" is set to "**Inverse OOTF**." (See 4-15. "OOTF OUT for HLG.")
* This command is disabled when FA-9600 is in 3D-LUT mode.
* See "OOTF for HLG" in FA-9600 Operation Manual.

4-19. OOTF for SR-Live

Command statement:
Dynamic Range CONV,<ID code>**,OOTF FOR SR-Live,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Inverse OOTF
2	OOTF

* This command is disabled when FA-9600 is in 3D-LUT mode.
* This command is enabled with FA-96AHDR2 option. See “OOTF for SR-Live” in FA-9600 Operation Manual for details on other requirements.

4-20. KNEE (RGB) CLIP White Clip

Command statement:
Knee Clip,<ID code>**,White Clip Enable,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Enable

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-21. KNEE (RGB) CLIP White Knee Type

Command statement:
Knee Clip,<ID code>**,Knee Type,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
0	Y
1	RGB

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-22. KNEE (RGB) CLIP White Output Clip

Command statement:
Knee Clip,<ID code>**,White Clip,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
500-1500	**50.0-150.0%** (in 0.5 increments) Sets the White threshold in RGB.

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-23. KNEE (RGB) CLIP White Knee Slope

Command statement:
Knee Clip,<ID code>**,Knee Slop,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
10-100	**0.10-1.00** (in 0.05 increments) Sets the knee slope inclination (compression ratio) .

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-24. KNEE (RGB) CLIP White Knee Point

Command statement:
Knee Clip,<ID code>**,Knee Point,**<Value>**[CR][LF]**

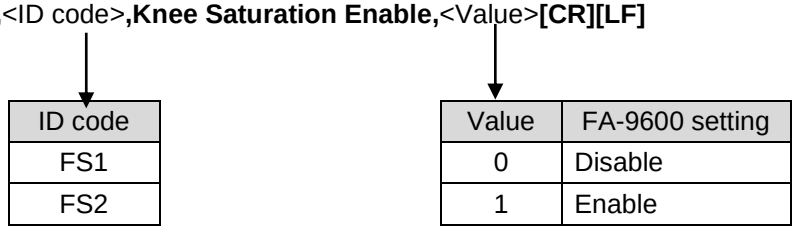
ID code
FS1
FS2

Value	FA-9600 setting
500-1500	**50.0-150.0%** (in 0.5 increments) Sets the knee slope start point. The maximum and default values vary depending on White Leve (RGB White CLIP) setting.

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-25. KNEE Saturation Enable

Command statement:
Knee Clip,<ID code>**,Knee Saturation Enable,**<Value>**[CR][LF]**



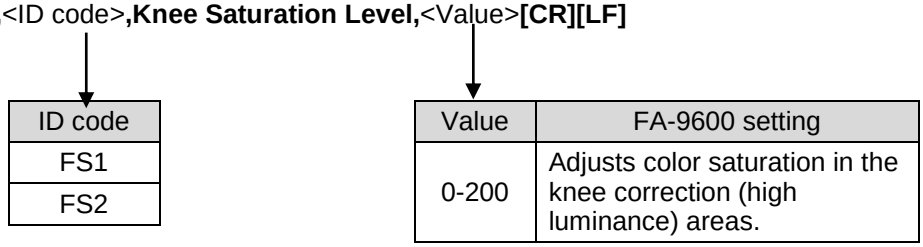
ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Enable

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-26. KNEE Saturation Level

Command statement:
Knee Clip,<ID code>**,Knee Saturation Level,**<Value>**[CR][LF]**



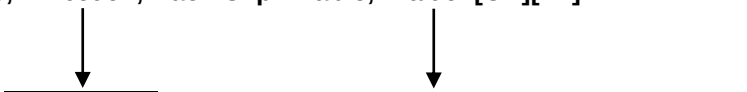
ID code
FS1
FS2

Value	FA-9600 setting
0-200	Adjusts color saturation in the knee correction (high luminance) areas.

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-27. KNEE (RGB) CLIP Black Clip

Command statement:
Knee Clip,<ID code>**,Black Clip Enable,**<Value>**[CR][LF]**



ID code
FS1
FS2

Value	FA-9600 setting
0	Disable
1	Enable

* This command is disabled when FA-9600 is in 3D-LUT mode.
* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

4-28. KNEE (RGB) CLIP Black Output Clip

Command statement:

Knee Clip,<ID code>**,Black Clip,**<Value>**[CR][LF]**

ID code
FS1
FS2

Value	FA-9600 setting
-500 to 500	**-50.0 to 50.0%** (in 0.1 increments) Sets the Black threshold for RGB space.

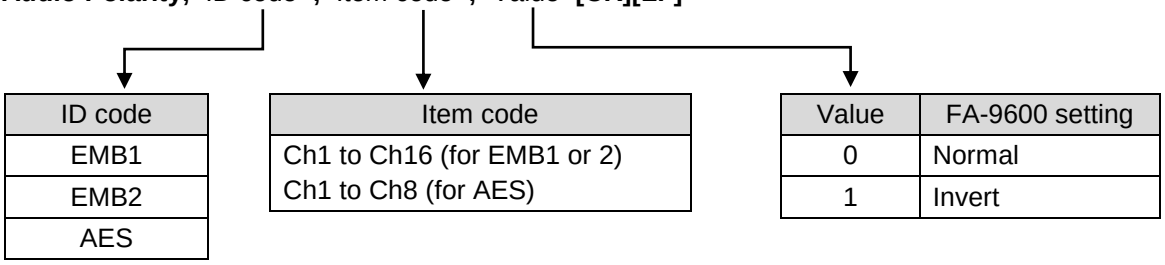
* This command is disabled when FA-9600 is in 3D-LUT mode.

* See “KNEE (RGB) CLIP (White/Black)” in FA-9600 Operation Manual.

5. Audio Commands

5-1. Audio Polarity

Command statement:
Audio Polarity,<ID code>**,**<Item code>**,**<Value>**[CR][LF]**



ID code
EMB1
EMB2
AES

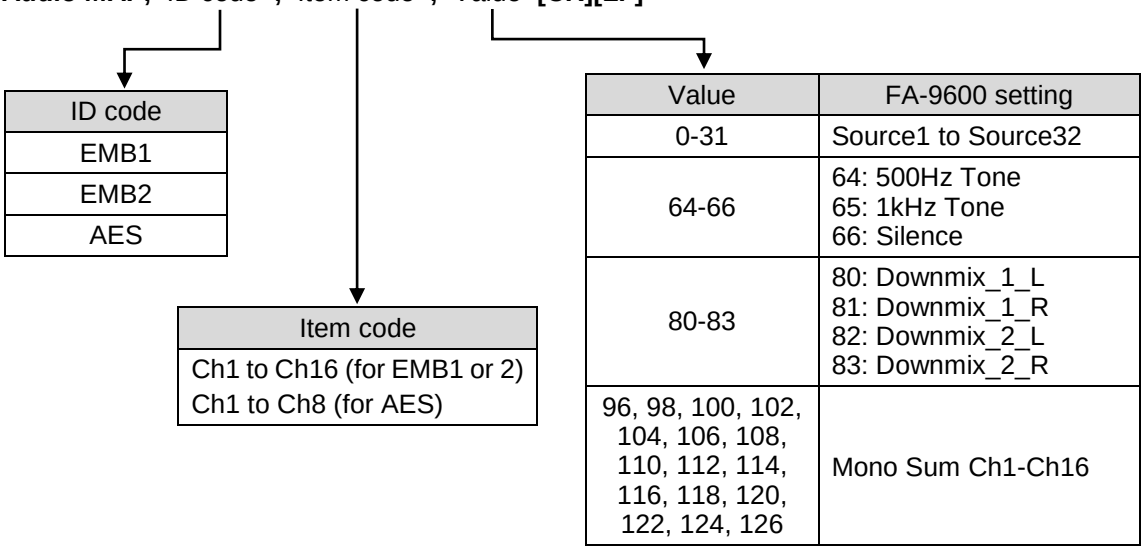
Item code
Ch1 to Ch16 (for EMB1 or 2) Ch1 to Ch8 (for AES)

Value	FA-9600 setting
0	Normal
1	Invert

* This command is disabled for EMB2 (ID code) when FA-9600 is in 3D LUT mode.
* See “EMD. AUDIO INPUT POLARITY” and ”AES AUDIO INPUT POLARITY” in FA-9600 Operation Manual.

5-2. Audio MAPPING

Command statement:
Audio MAP,<ID code>**,**<Item code>**,**<Value>**[CR][LF]**



ID code
EMB1
EMB2
AES

Item code
Ch1 to Ch16 (for EMB1 or 2) Ch1 to Ch8 (for AES)

Value	FA-9600 setting
0-31	Source1 to Source32
64-66	64: 500Hz Tone 65: 1kHz Tone 66: Silence
80-83	80: Downmix_1_L 81: Downmix_1_R 82: Downmix_2_L 83: Downmix_2_R
96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126	Mono Sum Ch1-Ch16

* This command is disabled for EMB2 (ID code) when FA-9600 is in 3D LUT mode.
* See “EMB. AUDIO OUTPUT MAPPING” and ”AES AUDIO OUTPUT MAPPING” in FA-9600 Operation Manual.

5-3. Audio Master Gain

Command statement:
Audio Gain,<ID code>**,Master[SP]Gain,**<Value>**[CR][LF]**

ID code
EMB1
EMB2
AES

Value	FA-9600 setting
-200 to +200	**-20.0 to +20.0dB** (in 0.1 increments) : Sets Gain Offset for all channels.

* This command is disabled for EMB2 (ID code) when FA-9600 is in 3D LUT mode.
* See “AUDIO OUTPUT GAIN” in FA-9600 Operation Manual.

5-4. Audio Gain

Command statement:
Audio Gain,<ID code>**,**<Item code>**,**<Value>**[CR][LF]**

ID code
EMB1
EMB2
AES

Value	FA-9600 setting
-200 to +200	-20.0 to +20.0dB (in 0.1 increments) Adjusts the channel gain.

Item code
Ch1 to Ch16 (if EMB1/2 selected for ID code) Gain[SP]Ch1 to Ch8 (if AES selected for ID code)

* This command is disabled for EMB2 (ID code) when FA-9600 is in 3D LUT mode.
* See “AUDIO OUTPUT GAIN” in FA-9600 Operation Manual.

5-5. Audio Master Delay

Command statement:
Audio Delay,<ID code>**,Master,**<Value>**[CR][LF]**

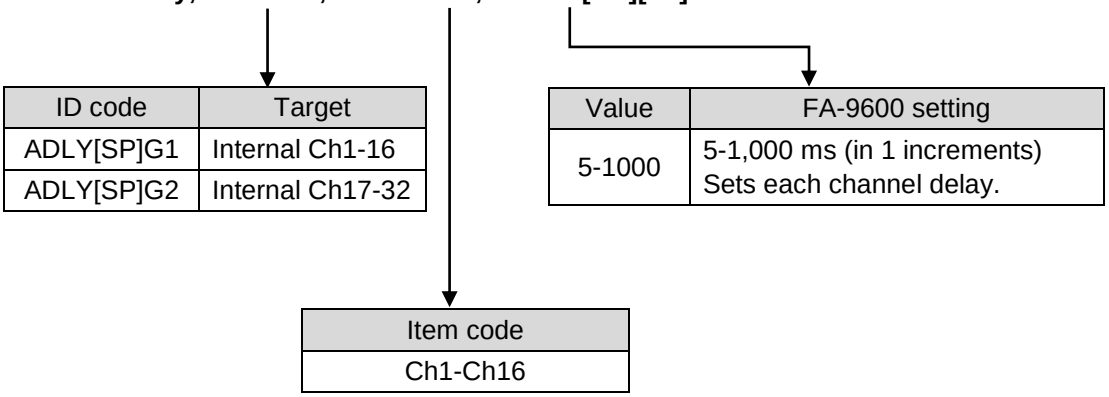
ID code	Target
ADLY[SP]G1	Internal Ch1-16
ADLY[SP]G2	Internal Ch17-32

Value	FA-9600 setting
5-1000	5-1,000 ms (in 1 increments) Sets the delay offset shared by the specified 16 channels.

* See “AUDIO INPUT DELAY” in FA-9600 Operation Manual.

5-6. Audio Delay

Command statement:
Audio Delay,<ID code>**,**<Item code>**,**<Value>**[CR][LF]**



ID code	Target
ADLY[SP]G1	Internal Ch1-16
ADLY[SP]G2	Internal Ch17-32

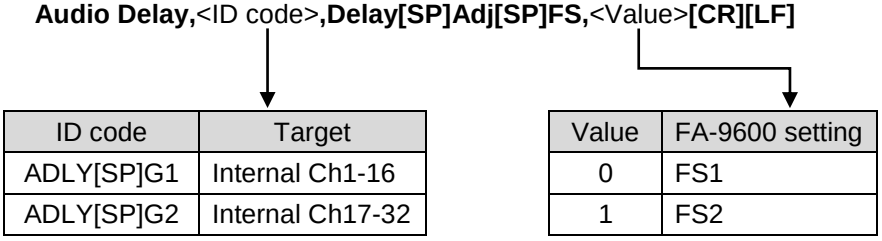
Value	FA-9600 setting
5-1000	5-1,000 ms (in 1 increments) Sets each channel delay.

Item code
Ch1-Ch16

* See “AUDIO INPUT DELAY” in FA-9600 Operation Manual.

5-7. Audio Delay ADJUST FS SELECT

Command statement:
Audio Delay,<ID code>**,Delay[SP]Adj[SP]FS,**<Value>**[CR][LF]**



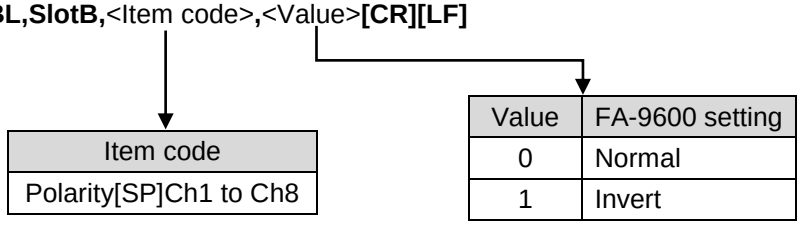
ID code	Target
ADLY[SP]G1	Internal Ch1-16
ADLY[SP]G2	Internal Ch17-32

Value	FA-9600 setting
0	FS1
1	FS2

* See “AUDIO DELAY ADJUST FS SELECT” in FA-9600 Operation Manual.

5-8. FA-96AES-UBL Polarity

Command statement:
FA-96AESUBL,SlotB,<Item code>**,**<Value>**[CR][LF]**



Item code
Polarity[SP]Ch1 to Ch8

Value	FA-9600 setting
0	Normal
1	Invert

* This command requires FA-96AES-UBL.
* See “AES AUDIO INPUT POLARITY” in FA-9600 Operation Manual.

5-9. FA-96AES-UBL MAPPING

Command statement:
FA-96AESUBL,SlotB,<Item code>**,**<Value>**[CR][LF]**

Item code
MAP[SP]Ch1 to Ch8

Value	FA-9600 setting
0-31	Source1 to Source32
64-66	64：500Hz Tone 65：1kHz Tone 66：Silence
80-83	80：Downmix_1_L 81：Downmix_1_R 82：Downmix_2_L 83：Downmix_2_R
96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126	Mono Sum Ch1-Ch16

* This command requires FA-96AES-UBL.
* See “AES AUDIO OUTPUT MAPPING” in FA-9600 Operation Manual.

5-10. FA-96AES-UBL Master Gain

Command statement:
FA-96AESUBL,SlotB,Master Gain,<Value>**[CR][LF]**

Value	FA-9600 setting
-200 to +200	-20.0 to +20.0dB (in 0.1 increments) Sets Gain Offset for all channel.

* This command requires FA-96AES-UBL.
* See “AUDIO OUTPUT GAIN” in FA-9600 Operation Manual.

5-11. FA-96AES-UBL Gain

Command statement:
FA-96AESUBL,SlotB,<Item code>**,**<Value>**[CR][LF]**

Item code values
Gain[SP]Ch1 to Ch8

Value	FA-9600 setting
-200 to +200	-20.0 to +20.0dB (in 0.1 increments) Sets the channel gain value.

* This command requires FA-96AES-UBL.
* See “AUDIO OUTPUT GAIN” in FA-9600 Operation Manual.

6. Other Commands

6-1. Power On

Command statement:
PowerOn,COM,CHK,1[CR][LF]

Start command control with this request command and send the next command after receiving "ACK."

6-2. Event Load

Command statement:
Event,COM,Load,<Value>**[CR][LF]**

Value	Description
0-100	Loads the specified event data to FA-9600. Loading Event 0 resets F-9600.

6-3. Event Save

Command statement:
Event,COM,Save,<Value>**[CR][LF]**

Value	Description
1-100	Saves all settings to the specified event number.

6-4. Video Status Request

Command statement:
Status1,<ID code>**,Get,0[CR][LF]**

ID code	Description
FS1	Request for FS1 video status
FS2	Request for FS2 video status

6-5. Audio 1 Status Request

Command statement:
Status2,<ID code>**,Get,0[CR][LF]**

ID code	Description
EMB1	Request for FS1 embedded audio status
EMB2	Request for FS2 embedded audio status
AES	Request for AES audio status

6-6. Audio 2 Status Request

Command statement:
Status3,<ID code>,**Get,0[CR][LF]**

ID code	Description
ADLY G1	Request for audio delay group 1 status
ADLY G2	Request for audio delay group 2 status

6-7. Audio Option Status Request

Command statement:
Status4,SlotB,Get,0[CR][LF]

* FA-96AES-UBL option required

7. Status Messages from FA-9600

FA-9600 issues a status message whenever the either of the following conditions is met:

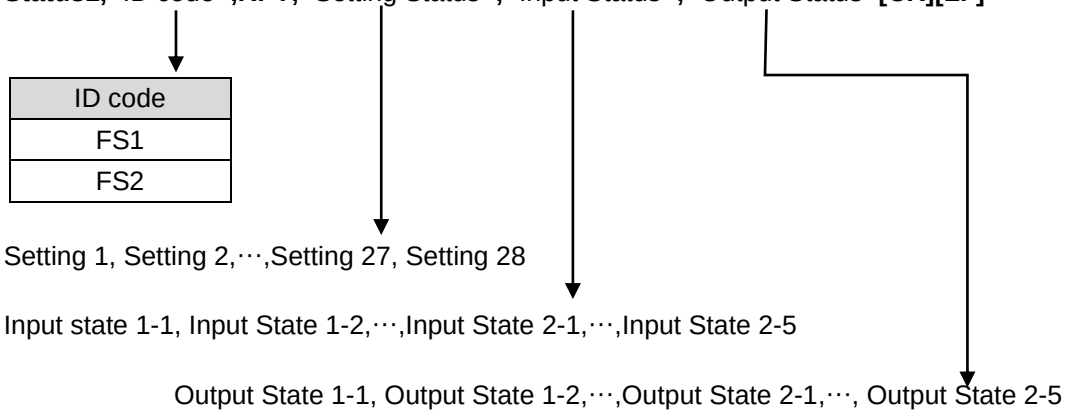
1. FA-9600 receives a status request command from a Command Device.
2. FA-9600 status changes by other means than the remote commands. (Status report)

FA-9600 sends status messages using UDP/IP protocols.

For Condition 2 (status report), FA-9600 detects changes at 500 - 1000 msec intervals. If any change is detected, only the changed item status is reported.
Send **ACK[CR][LF]** when receiving status report messages. Otherwise, FA-9600 re-transmits the message up to three times at 1 sec intervals and no ACK is still returned, FA-9600 performs the timeout processing.

7-1. Video Status Message

Return message:
Status1,<ID code>**,RPT,**<Setting Status>**,**<Input Status>**,**<Output Status>**[CR][LF]**



◆ **<Setting Status>**

Variable	Setting range	Reference for parameter details
Setting1	0, 1	Sec. 4-1 “Dynamic Range, Color Space and 3D LUT Conversions.”
Setting2	1-10	Sec. 4-2 EOTF DeGamma.”
Setting3	1-6	Sec. 4-3 “In Color Space.”
Setting4	1-10	Sec. 4-4 “OETF Gamma.”
Setting5	1-6	Sec. 4-5 “Out Color Space.”
Setting6	1-11	Sec. 4-6 “3D-LUT Data.”
Setting7	-2400 to +2400	Sec. 4-7 “Gain Adjustment.”
Setting8	0 to ＋2400	Sec. 4-8 “SDR Gain Adjustment.
Setting9	0, 1	Sec. 4-9 “Gain Simultaneous Mode.”
Setting10	0, 1	Sec. 4-10 “OOTF for HLG Mode.“
Setting11	0, 1	Sec. 4-11 “OOTF IN for HLG.“
Setting12	10-20	Sec. 4-12 “OOTF IN System Gamma for HLG.“
Setting13	100-10000	Sec. 4-13 “OOTF IN Display Peak for HLG.“
Setting14	0-100	Sec. 4-14 “OOTF IN Display Black for HLG.“
Setting15	0, 1	Sec. 4-15 “OOTF OUT for HLG.“
Setting16	10-20	Sec. 4-16 “OOTF OUT System Gamma for HLG.“
Setting17	100-10000	Sec. 4-17 “OOTF OUT Display Peak for HLG.“
Setting18	0-100	Sec. 4-18 “OOTF OUT Display Black for HLG.“
Setting19	0-2	Sec. 4-19 “OOTF for SR-Live.”

Setting20	0, 1	Sec. 4-20 “KNEE (RGB) CLIP White Clip.“
Setting21	0, 1	Sec. 4-21 “KNEE (RGB) CLIP White Knee Type.”
Setting22	500-1500	Sec. 4-22 “KNEE (RGB) CLIP White Output Clip.“
Setting23	10-100	Sec. 4-23 “KNEE (RGB) CLIP White Knee Slope.“
Setting24	500-1500	Sec. 4-24 “KNEE (RGB) CLIP White Knee Point.“
Setting25	0, 1	Sec. 4-25 “KNEE Saturation .”
Setting26	0-200	Sec. 4-26 “KNEE Saturation .”
Setting27	0, 1	Sec. 4-27 “KNEE (RGB) CLIP Black Clip.“
Setting28	-500 to 500	Sec. 4-28 “KNEE (RGB) CLIP Black Output Clip.“

◆ **<Input Status / Output Status>**

	Number of lines for video	Video H Size	Video frame rate	SDI signal level	SDI signal division
Variable / Value	(FS)1-1 (FS)2-1	(FS)1-2 (FS)2-2	(FS)1-3 (FS)2-3	(FS)1-4 (FS)2-4	(FS)1-5 (FS)2-5
1	None	None	None	None	None
0	Not Used	Not Used	Not Used	Not Used	Not Used
1	525	1920	60p	Level-A	2QD
2	625	2048	59.94p	Level-B	2SI
3	720	3840	50p	Level-B(Dual Stream)	
4	1080	4096	48p		
5	2160(12G)		47.95p		
6	2160(3Gx4)		30p		
7	2160(6G)		29.97p		
8	2160(3Gx2)		25p		
9	2160(1.5Gx4		24p		
10			23.98p		
11			60i/30PsF		
12			59.94i/29.97PsF		
13			50i/25PsF		
14			24PsF		
15			23.98PsF		
16			30PsF		
17			29.97PsF		
18			25PsF		
19			48PsF		
20			47.95PsF		

7-1-1. Input / Output Status Examples in Messages

Ex. 1) Input State return values if no signal is present at Input 1 (FS1)

<Input State1-1>: **-1** (None)
<Input State1-2>: **-1** (None)
<Input State1-3>: **-1** (None)
<Input State1-4>: **-1** (None)
<Input State1-5>: **-1** (None)

Values "**-1,-1,-1,-1,-1**" are returned.

Ex. 2) Input State return values if 1080/59i signal is present at Input 2 (FS2)

<Input State2-1>: **4** (1080)
<Input State2-2>: **1** (1920)
<Input State2-3>: **12** (59i/29.98PsF)
<Input State2-4>: **0** (Not Used)
<Input State2-5>: **0** (Not Used)

Values "**4,1,12,0,0**" are returned.

Ex. 3) Output State return values if Output 2 (FS2) signal is 1080/59p Level-A

<Output State2-1>: **4** (1080)
<Output State2-2>: **1** (1920)
<Output State2-3>: **2** (59.94p)
<Output State2-4>: **1** (Level-A)
<Output State2-5>: **0** (Not Used)

Values "**4,1,2,1,0**" are returned.

Ex. 4) Output State return values if Output 1 (FS1) signal is 2160x3840/59p through 12G-SDI (Level-A, 2SI)

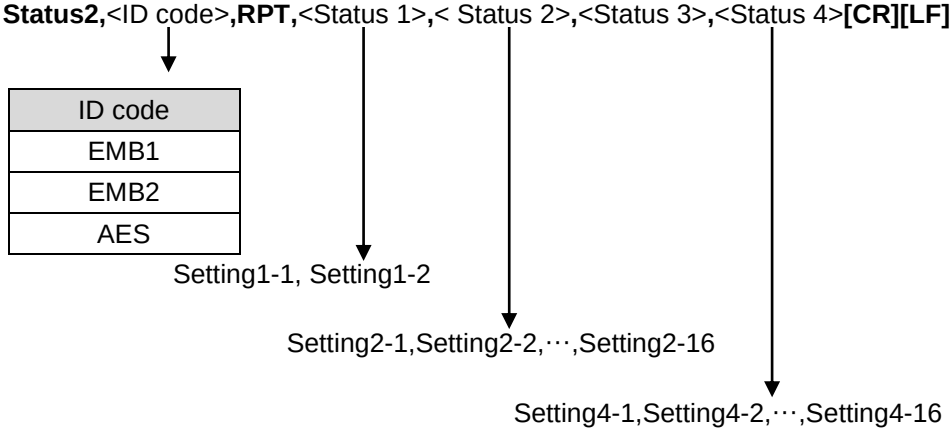
<Output State1-1>: **5** (2160 (12G))
<Output State1-2>: **3** (3840)
<Output State1-3>: **2** (59.94p)
<Output State1-4>: **1** (Level-A)
<Output State1-5>: **2** (2SI)

Values "**5,3,2,1,2**" are returned.

7-2. Audio 1 Status Message

Return message:

Status2,<ID code>**,RPT,**<Status 1>**,**< Status 2>**,**<Status 3>**,**<Status 4>**[CR][LF]**



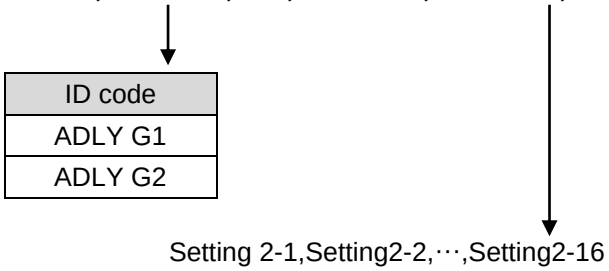
◆ **<Status> (Setting Status)**

Variable	Setting range	Remarks	Reference
Setting1-1	00000000 to 11111111	Ch1-8 Audio Polarity settings	Sec. 5-1 “Audio Polarity”
Setting1-2	00000000 to 11111111	Ch9-16 Audio Polarity settings	
Setting2-xx (xx: Channel1-16)	0-31,64-66,80-83, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126	Ch1-16 mapping	Sec. 5-2 “Audio MAPPING”
Setting3	-200 to +200	Audio Master Gain setting	Sec. 5-3 “Audio Master Gain”
Setting4-xx (xx: Channel1-16)	-200 to +200	Ch1-16 Audio Gain settings	Sec. 5-4 “Audio Gain”

7-3. Audio 2 Status Message

Return message:

Status3,<ID code>**,RPT,**<Status 1>**,**<Status 2>**,**<Status 3>**[CR][LF]**



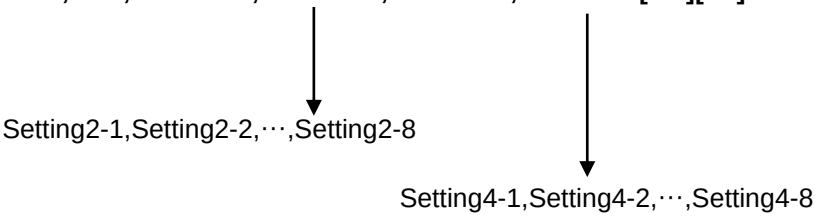
◆ **<Status> (Setting Status)**

Variable	Setting range	Remarks	Reference
Setting1	5-1000	Audio Master Delay setting	Sec. 5-5 “Audio Master Delay“
Setting2-xx (xx: Channel1-16)	5-1000	Ch1-16 Audio Delay settings	Sec. 5-6 “Audio Delay”
Setting3	0, 1	FS SELECT for Audio Delay Adjustment.	Sec. 5-7 “Audio Delay ADJUST FS SELECT“

7-4. Audio Option Status Message

Return Message:

Status4,SlotB,RPT,<Status1>**,**<Status2>**,**<Status3>**,**<Status4>**[CR][LF]**



◆ **<Status> (Setting Status)**

Variable	Setting range	Remarks	Reference
Setting1-1	00000000 to 11111111	Ch1-8 Audio Polarity settings	Sec. 5-8 “FA-96AES-UBL Polarity”
Setting1-2	00000000 to 11111111	Ch9-16 Audio Polarity settings	
Setting2-x (x: Channel1-8)	0-31,64-66,80-83, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126	Ch1-8 mapping	Sec. 5-9 “FA-96AES-UBL MAPPING”
Setting3	-200 to +200	Audio Master Gain setting	Sec. 5-10 “FA-96AES-UBL Master Gain”
Setting4-x (x: Channel1-8)	-200 to +200	Ch1-8 Audio Gain settings	Sec. 5-11 “FA-96AES-UBL Gain”