

# Smart-telecaster™ HD View Single

## Smart-telecaster HD View Single User's Guide

Soliton Systems K.K.

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**Smart-telecaster HD View Single**

Ver2.3.2

Rev21

## What is “Smart-telecaster™ HD View Single”

Smart-telecaster™ HD View Single (hereinafter, referred to as "HD View Single" or “this product”) is a receiving application that Smart-telecaster™ series products can connect.

Smart-telecaster HD View (hereinafter, referred to as “HD View”) compatible.

As with HD View, it’s possible to connect with Smart-telecaster Zao (hereinafter, referred to as “Zao”), Smart-telecaster Zao-S (hereinafter, referred to as “Zao-S”), Zao App(hereinafter, referred to as “Zao App”).

### System Diagram

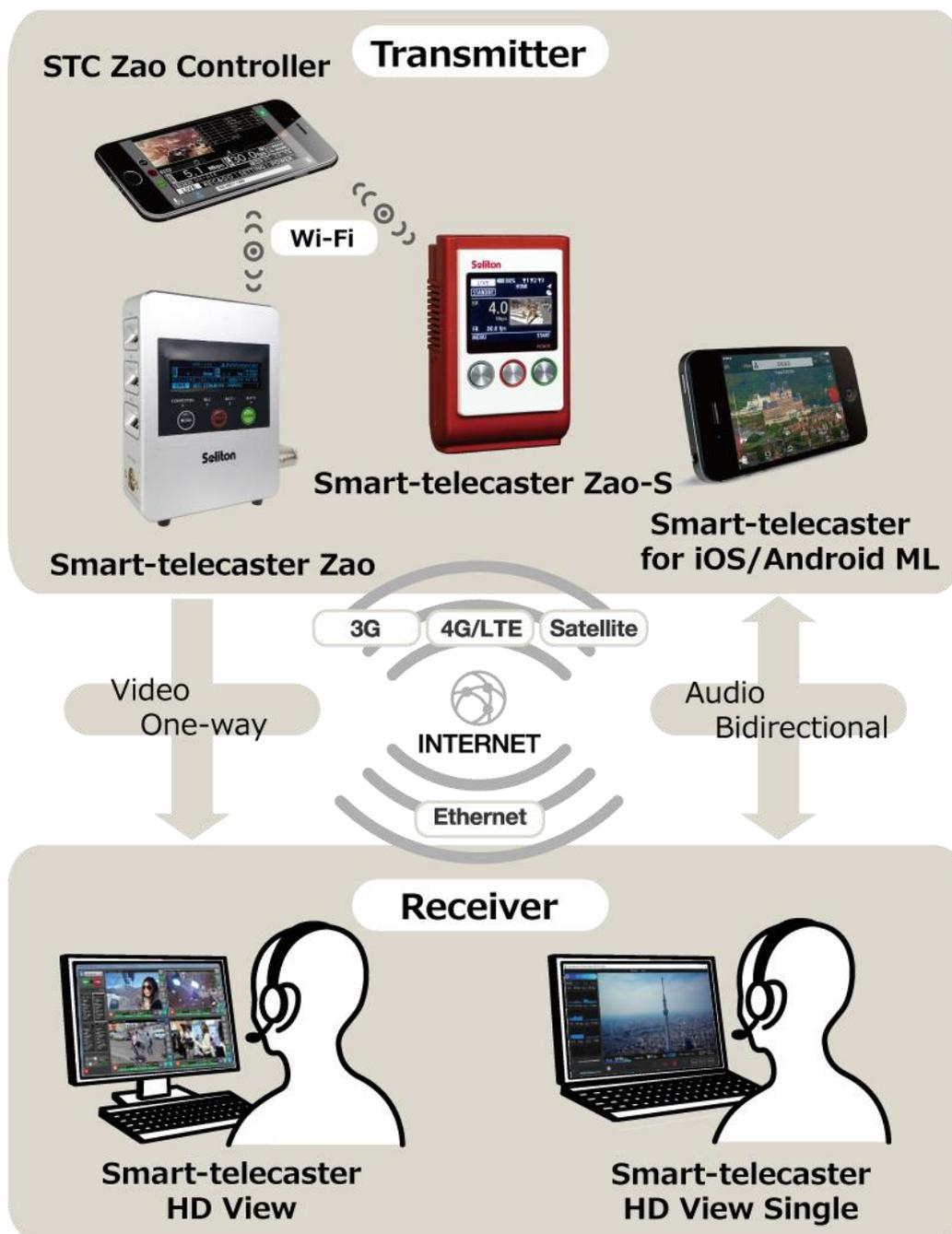


Figure 1 System Diagram

## Notes.

- ❑ For Zao/Zao-S and Zao App, can refer to the function from each User's Guide.
- ❑ The contents described in Smart-telecaster HD View Single User's Guide (this document) may differ depending on the version of HD View Single are using.
- ❑ If already using HD View Single, please update to the latest version.
- ❑ The contents stated in this document may be changed without notice.
- ❑ In order to view this document, the terminal needs to be connected to the internet.

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- ❑ The connection form described in this document is an example only. Not all combinations are guaranteed.

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# 1 Main screen

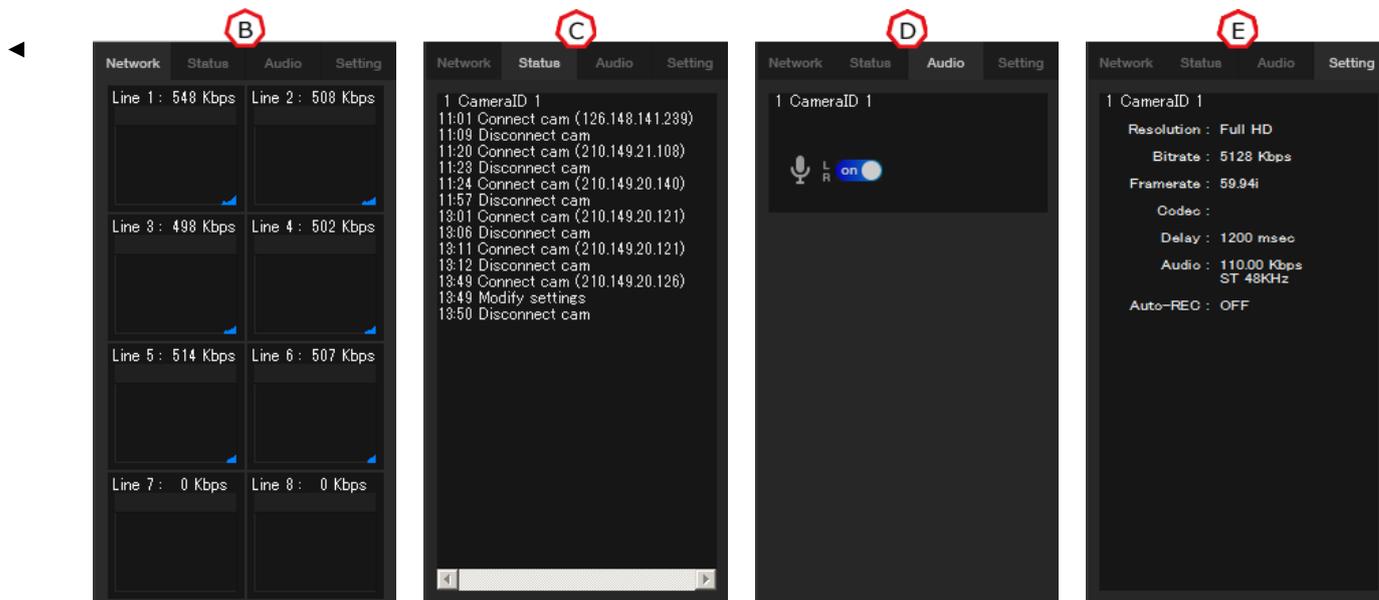
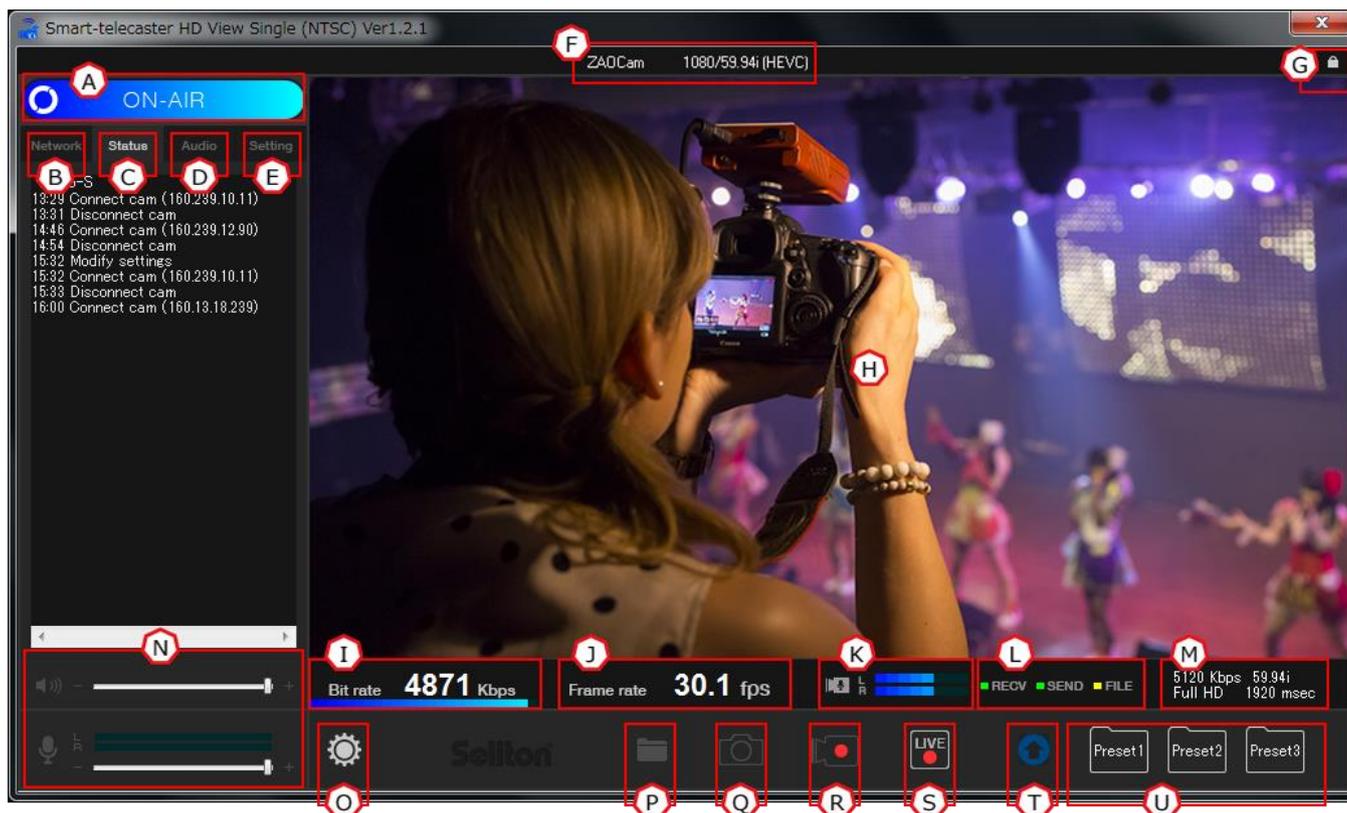


Figure 2 Main screen

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(A) Status indicator

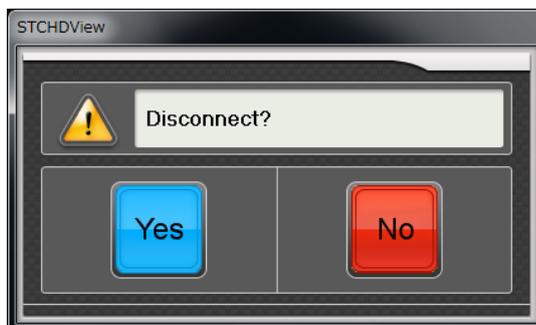
Displays the current status of HD View Single.

/STANDBY – Waiting (not connect)

/ON-AIR – Connecting

When you click on Status indicator in the ON-AIR state, a disconnect confirmation window will be displayed.

By clicking “Yes” on disconnect confirmation window, can disconnect the broadcast.



**Figure 3 Disconnect confirmation window**

(B) Network tab

Displays the status of the communication line used for broadcast in numerical value and graph.

\* Status displayed only during connection.

(C) Status tab

Displays the operation status of HD View single in a message.

/Connect cam (xxx.xxx.xxx.xxx) – Start broadcast

/Disconnect cam – End broadcast

/Modify settings – Change setting

/DelayFail Warning! xxxx msec – network quality deteriorated

/Authentication failed - Both authentication settings are incorrect.

(D) Audio tab

Specify ON/OFF of audio function.

When it's set to OFF, bidirectional audio relay is stopped.

(E) Setting tab

Each set value at broadcast is displayed.

#### (F) Transmitter Information

Information on the connected transmitter is displayed.

From the left, "STC Cam Name", "Input Video Format", and "Codec" are displayed.

- \* When the transmitter is Smart-telecaster for iOS / Android ML, the video format corresponding to the "Video Signal" and "Output Video Resolution" in the application is displayed.

#### (G) Encryption icon

Display encrypted status.

If encryption is enabled, the  icon is displayed.

#### (H) Preview

Display receive video

- \* The preview can be displayed in full screen with Alt + enter key.
- \* Press Alt + Enter key again to return to Main screen.
- \* When connecting Zao App, if the video encoding of Zao App is set to AVC (H.264), the preview will not be displayed.

#### (I) Bitrate

Display broadcast video traffic volume.

The current value for the set value is displayed at the level by the indicator.

#### (J) Framerate

Display framerate

#### (K) Broadcast audio indicator

Display broadcast audio volume.

When the setting is stereo, Top is left (1ch) audio, Bottom is Right (2ch) audio.

When the setting is monaural, The audio level of the ch set above and below is displayed.

#### (L) Packet indicato

Flashes when data communication occurs.

/RECV – Receive broadcast packet

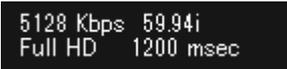
/SEND – Send broadcast packet

/FILE – Receive REC&GO packet

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(M) Broadcast settings

Display broadcast settings and REC&GO receive progress.



5128 Kbps 59.94i  
Full HD 1200 msec

**Figure 4 Broadcast settings**



File receiving... 53%

**Figure 5 REC&GO receive progress**

(N) Receiver audio indicator

The speaker icon displays output broadcast audio level and settings.

Microphone icon displays IFB (Interruptible feedback) audio level and settings.

Can adjust the volume by operating the slide bar. Also, output audio is displayed in the level.

When an error occurs in input/output audio device, an X mark appears on the icon.

- \* When BMD device is connected, Broadcast audio is automatically output from BMD device. If BMD device is not connected, Broadcast audio is output from the Windows default playback device.
- \* IFB audio is input from the Windows default recording device.
- \* If change Windows default playback/recording device, need to restart HD View Single changing it.

(O) Config button

Display config screen.

◀

**(P) REC&GO file playback button**

Can playback recorded/transferred files with Zao's REC&GO.

- \* Recorded file is saved in the folder specified by the extension of taf
- \* The folder can be changed with config screen.

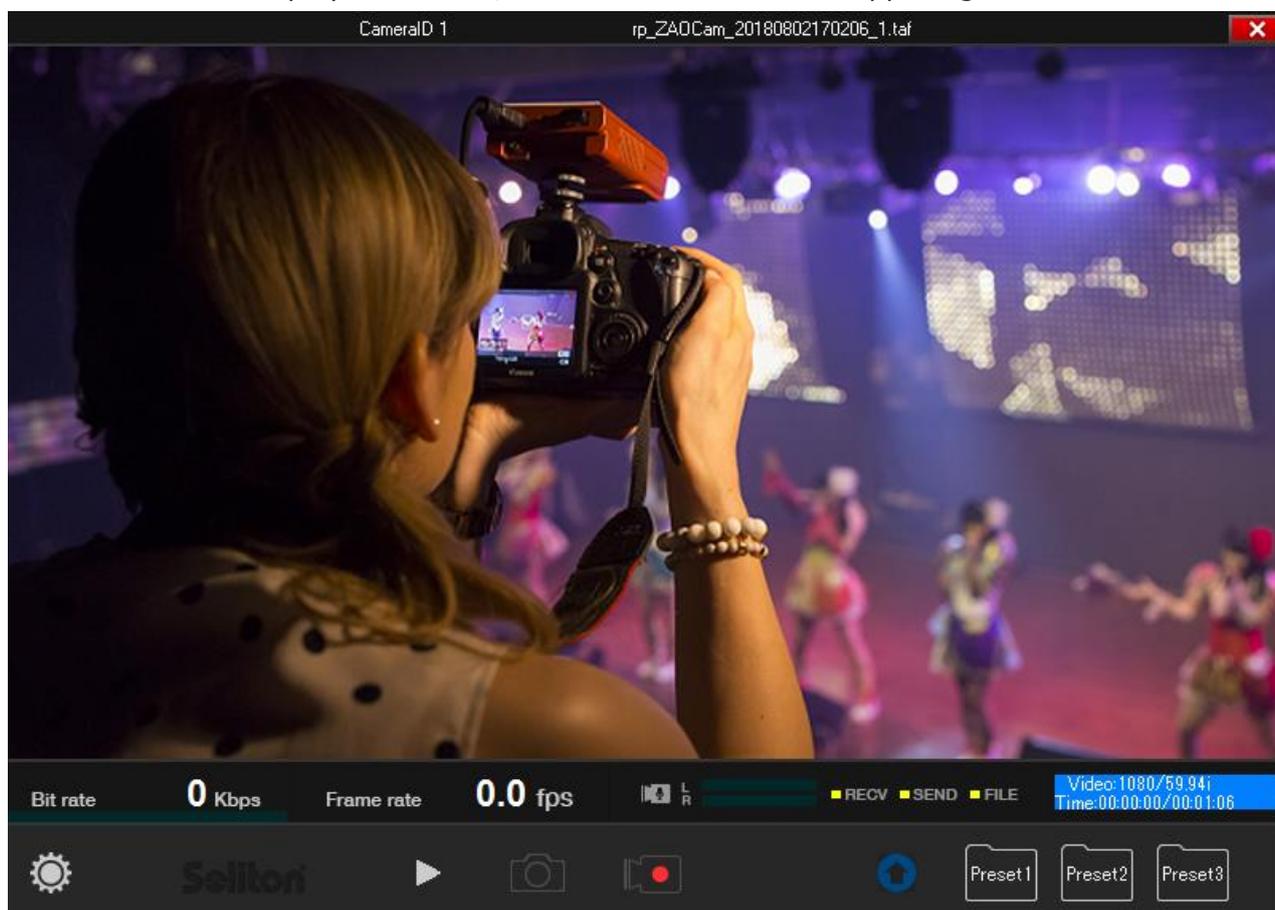
When click the button, Windows Explorer will be displayed.

Select the recorded file want to playback.

- \* If the file size is large, reading may take time.

When reading of the file is completed, the button changes.

- \* It changes to a pause button during playback.
- \* If want to exit playback mode, click the X button in the upper right.



**Figure 6 REC&GO playback mode**

**(Q) Snapshot button**

Get snapshot of broadcast video. Snapshot is saved in jpg format.

- \* Can change the folder to save with config screen.

**(R) REC button**

Start / stop broadcast video recording.

## (S) Live button

Set RTMP transcode to ON / OFF. The button shows the current state.

Streaming ON – Click to start RTMP transcode

Streaming OFF – Click to stop RTMP transcode

- \* It's displayed when Video streaming is Transcode.
- \* It's not displayed when Transcode settings is set to Disable (LocalRec Mode)



**Figure 7 Live button**

## (T) BMD device indicator

When BMD device is connected to the PC, the indicator changes to blue.

- \* If connect BMD device after HD View Single startup, please restart HD View Single.



**Figure 8 BMD device indicator**

## (U) Preset button

Apply the set preset. The preset can be set with config screen.

- \* Values that can be registered as presets are Bitrate / Compression settings / Resolution / Delay
- \* Applied presets are grayed out.



**Figure 9 Preset**

## 2 Config screen

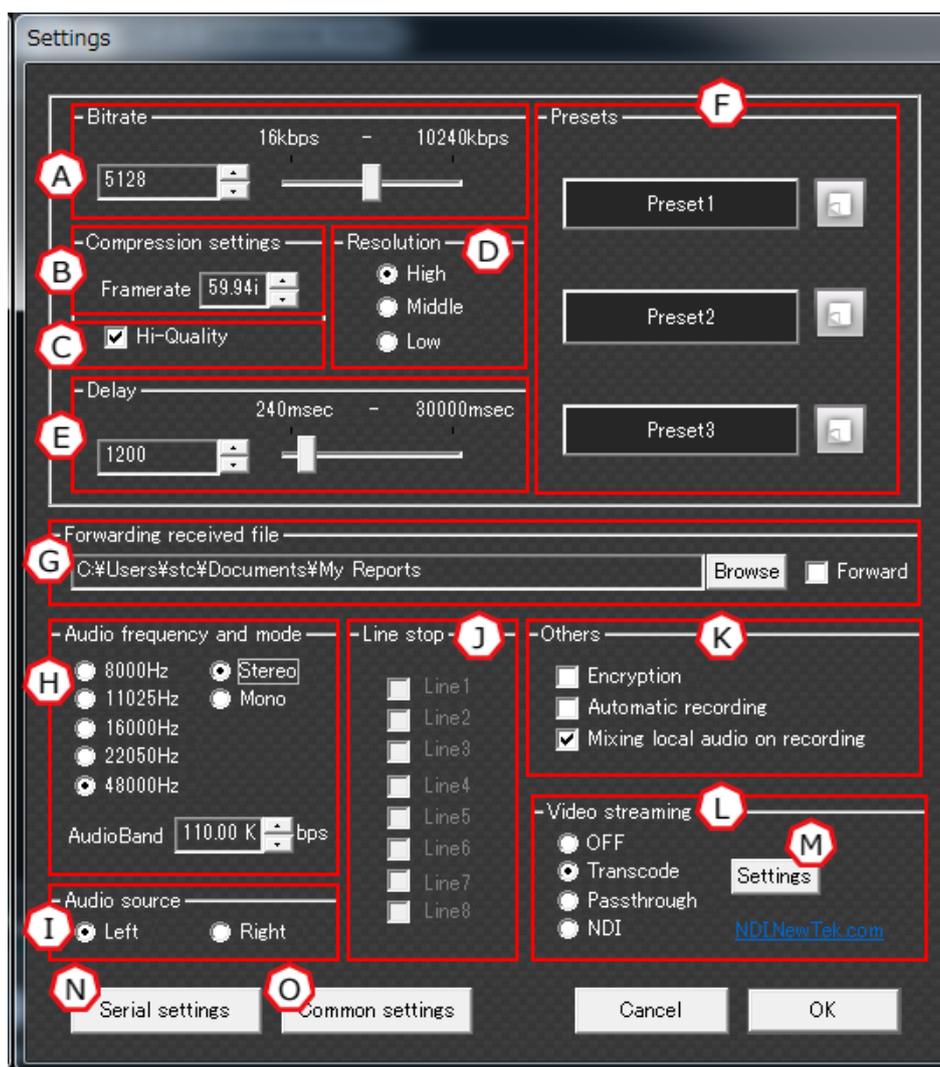


Figure 10 Config screen

## (A) Total bitrate [Bitrate]

Specify the bitrate of broadcast video and audio.

\* The maximum values are Zao:10Mbps, Zao-S:5Mbps, iOS/Android ML 8Mbps.

## (B) Video framerate [Framerate]

Specify the framerate of broadcast video.

## (C) Hi quality encode [Hi-Quality]

By checking, enabled hi quality encode mode.

Improve image quality without increasing bitrate.

## (D) Video resolution [Resolution]

Specify resolution of broadcast video resolution.

The effective resolution varies depending on the type of transmitter, input video to transmitter, framerate settings. For details, check the correspondence table below.

**Table 1 Resolution correspondence table - 1**

Transmitter: Smart-telecaster Zao-S (Input video: 1080p 59.94/50)		
Resolution Settings	Framerate Settings	Effective resolution
High	-	1920 x 1080
Middle	-	1920 x 540
Low	-	960 x 540

Transmitter: Smart-telecaster Zao/Zao-S (Input video: 1080p 29.97/25)		
Resolution Settings	Framerate Settings	Effective resolution
High	-	1920 x 1080
Middle	-	1920 x 540
Low	-	960 x 540

Transmitter: Smart-telecaster Zao/Zao-S (Input video: 1080i 59.94/50)		
Resolution Settings	Framerate Settings	Effective resolution
High	-	1920 x 1080
Middle	59.94i/50i	960 x 1080
	29.97/25	1920 x 540
Low	-	960 x 540

Transmitter: Smart-telecaster Zao/Zao-S (Input video: 720p 59.94/50)		
Resolution	Framerate	Effective resolution
High	-	1280 x 720
Middle	-	640 x 720
Low	-	640 x 360

- \* "Effective resolution" is the resolution encoded between transmitter to HD View Single
- \* Video output from BMD device will be the same as input video.

Table 2 Resolution correspondence table – 2

Transmitter: Smart-telecaster Zao/Zao-S (Input video: 480i 59.94)		
Resolution	Framerate	Effective resolution
High	-	720 x 480
Middle	59.94i	360 x 480
	29.97	720 x 240
Low	-	360 x 240

Transmitter: Smart-telecaster Zao/Zao-S (Input video: 576i 50)		
Resolution	Framerate	Effective resolution
High	-	720 x 576
Middle	50i	360 x 576
	25	720 x 288
Low	-	360 x 288

Transmitter: Smart-telecaster Zao App for iOS/Android		
Resolution	Framerate	Effective resolution
High	-	1920 x 1080
Middle		1280 x 720
Low		640 x 360

Transmitter: Smart-telecaster for iOS/Android ML		
Resolution	Framerate	Effective resolution
High	-	960 x 540
Middle		640 x 360
Low		

- \* "Effective resolution" is the resolution encoded between transmitter to HD View Single
- \* Video output from BMD device will be the same as input video.

## (E) Buffering delay [Delay]

Specify the buffering value of broadcast video and audio.

Delay can be specified range 240 ~ 30000msec.

It corrects the frame by delaying the video and audio by the value.

- \* When the transmitter is Zao/Zao-S, delay can be specified in the range 480 ~ 30000msec. If it specified as 240/360msec, it will not work properly.

## (F) Preset set and call [Presets]

Can set the current setting as a preset.

- \* Values that can be registered as presets are Bitrate / Compression settings / Resolution / Delay

Clicking the preset name changes the setting value to the preset content.

- \* The preset name will be displayed as specified at registration.
- \* When call a preset, the preset name button turns green. When change the setting, the color returns to the original.



Figure 11 Call a preset

If click the  button to the right of the preset name, the registration window will be displayed. Input the preset name and click the "Save" button to register the current setting as a preset.

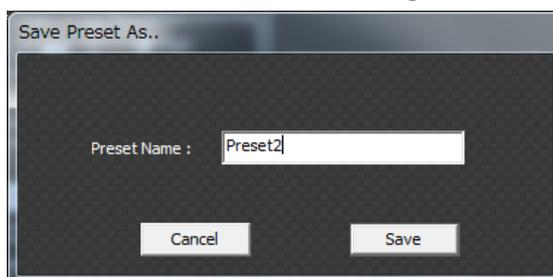


Figure 12 Registration window

## (G) Received file transfer destination [Forwarding received file]

Specify the transfer destination of the received file.

Checking "Forward" will take enabled.

- \* If it is unchecked or can not be transferred for some reason, it will be saved in the standard folder ("My Reports" folder in the document).

## (H) Audio frequency and channel [Audio frequency and mode]

Specify the audio sampling rate, stereo / monaural, and audio bitrate.

- \* When connected with iOS/Android ML, it's fixed to 22,050Hz.
- \* The value obtained by subtracting the audio bitrate from the bitrate is the value of the video bit rate.

Example) For bitrate: 5,000kbps and audio bitrate: 200kbps, effective bitrate is video bitrate: 4,800kbps and audio bitrate 200kbps.

In Audio Band, specify the bitrate to user for audio.

The settable bitrate varies depending on the audio frequency and channel setting.

**Figure 13 Audio bitrate settable range**

Audio frequency	Stereo		Monaural	
8,000Hz	11.71	~ 62.50	7.81	~ 41.01
11,025Hz	15.62	~ 85.93	11.71	~ 48.82
16,000Hz	23.43	~ 167.96	15.62	~ 97.65
22,050Hz	29.29	~ 167.96	15.62	~ 87.89
48,000Hz	68.35	~ 488.28	31.25	~ 234.37

## (I) Audio source select [Audio source]

When audio mode is set to monaural, it specifies which of left (1ch) or Right (2ch) will be relayed among the input audios.

- \* When audio mode is set to stereo, this setting is disabled.

## (J) Line stop during broadcast [Line stop]

Can pause/restart the line used during broadcast.

To pause, check the line want to pause and click the "OK" button.

To restart, uncheck the line want to restart and click the "OK" button.

- \* It does not work when 1 line network.

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(K) Other settings [Others]

Automatic encryption [Encryption]

By checking, broadcast data is encrypted by AES256.

- \* At the start of the broadcast, the transmitter generates the one-time key with the public-key cryptography.

Automatic recording [Automatic recording]

By checking, recording file is automatically generated at the start of broadcast.

- \* It works only when Video streaming is "Transcode" and "Disable (LocalRec Mode)" of settings is checked.

IFB audio mixing on recorded file [Mixing local audio on recording]

By checking, record send back audio in the recorded file.

- \* It works only when Video streaming is "Transcode" and "Disable (LocalRec Mode)" of settings is checked.

(L) Video streaming function select [Video streaming]

Video streaming function can be selected.

- \* Multiple functions can not be used at the same time.

◀ Disable [OFF]

Video streaming is disabled

RTMP transcode [Transcode]

Convert H265 broadcast to H264 RTMP and streamed.

It can be streamed to services such as Youtube live and Facebook live.

H.265 passthrough [Passthrough]

Streamed the H265 broadcast as it is.

Can check the video with a media player such as VLC. It can also be streamed to VMS such as Xprotect<sup>®</sup> etc.

NDI<sup>®</sup> output [NDI transmit]

Video output with NDI<sup>®</sup>.

(M) Transcode settings [settings]

Open RTMP transcode settings window.

(N) Serial port tunneling settings [Serial settings]

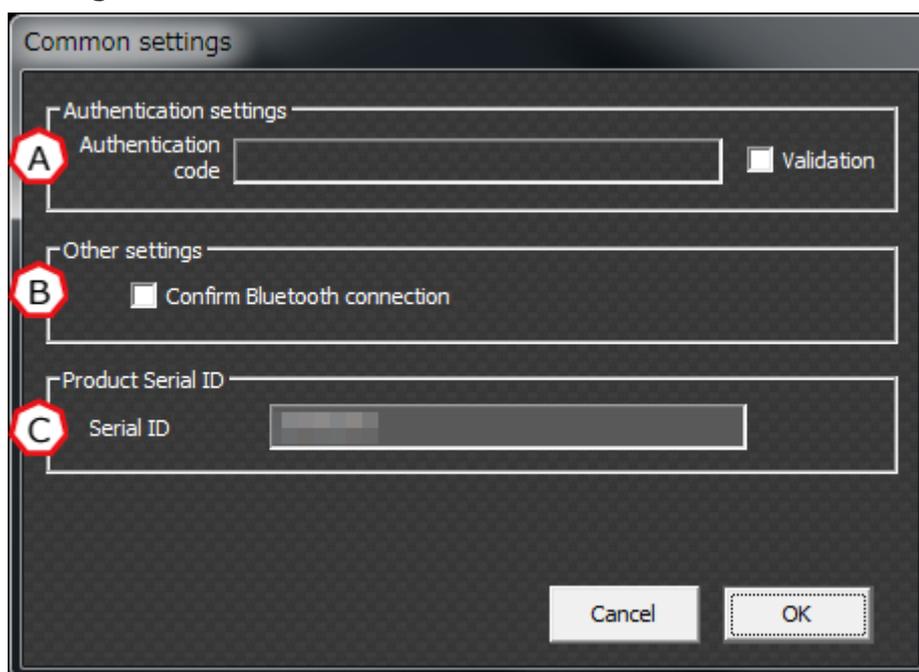
Open serial port tunneling settings window.

(O) Common settings [Common settings]

Open common settings window.



## 3 Common settings



**Figure 14 Common settings screen**

(A) Authentication [Authentication settings]

Connection authentication code [Authentication code]

Set the code for connection authentication with transmitter

The code can be up to 30 digits with half size alphanumeric characters.

- \* The inputted code is displayed with "\*".
- \* This function works only when the authentication flag is checked.

Authentication flag [Validation]

Enable connection authentication by checking.

- \* When enabled, only transmitter that has the same code can be connected.
- \* If Transmitter code and HD View Single code are different, or one function is invalid, connection cannot be made.

(B) Others [Other settings]

Bluetooth confirm [Confirm Bluetooth connection]

When HD View Single starts up, the device confirmation window of IFB audio device is displayed.

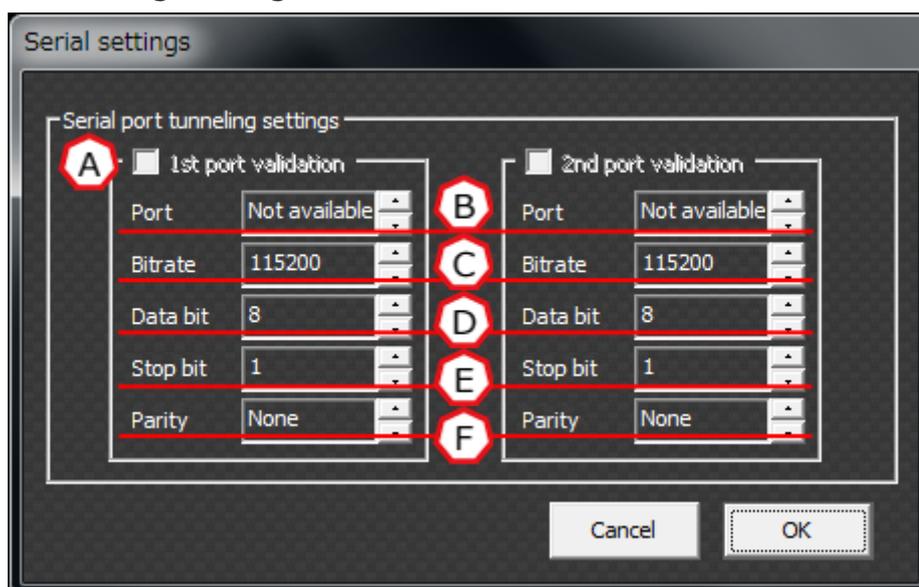
- \* As long as the window is displayed, IFB audio device can be changed.

(C) License information [Product Serial ID]

Serial ID [Serial ID]

Display serial id of the HD View Single.

## 4 Serial port tunneling settings



**Figure 15 Serial port tunneling settings screen**

(A) 1st port validation / 2nd port validation

Enable the function by checking it.

- \* If Port is "Not available", cannot check it.
- \* The same setting is necessary for Zao/Zao-S.
- \* Bitrate/Data bit/Stop bit/Parity must conform to the specifications of the serial communication equipment being used.

(B) Port

Can select com port that can communicate.

(C) Bitrate

Bitrate (baud rate) can be set.

(D) Data bit

Data bit can be set.

(E) Stop bit

Stop bit can be set.

(F) Parity

Parity can be set.

## 5 RTMP transcode settings

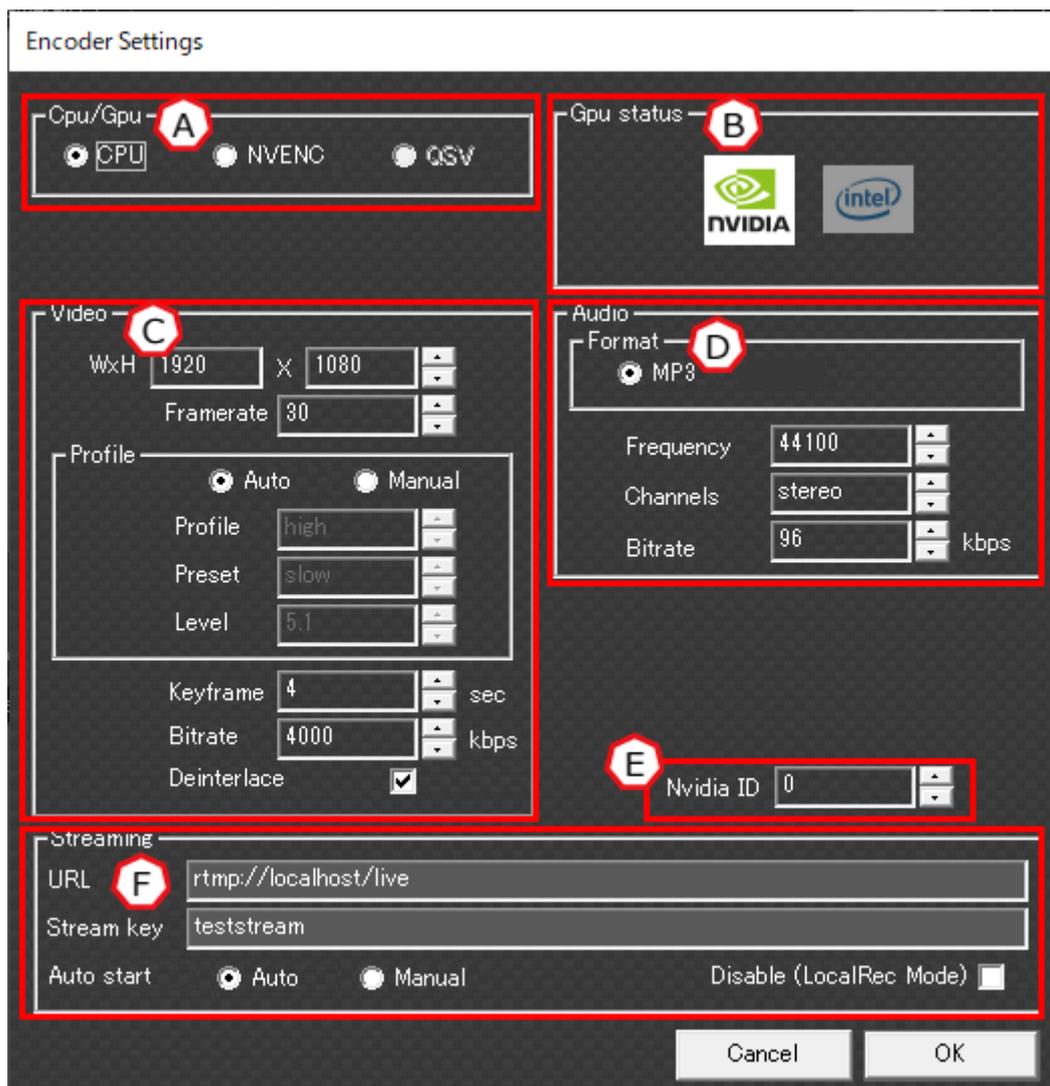


Figure 16 RTMP transcode settings screen

## (A) Encoder select [Cpu / Gpu]

Specify the encoder that performs RTMP transcode.

CPU – Use cpu encode.

NVENC – Use NVIDIA video encoder.

QSV – User Intel QSV (Quick Sync Video)

\* NVENC cannot be specified if the GPU status of NVIDIA is grayed out.

\* QSV cannot be specified if the GPU status of Intel is grayed out.

## (B) GPU status [Gpu status]

Display GPU status (NVIDIA/Intel QSV) available in HD View Single

\* If GPU status is grayed out, the encoder cannot be used due to problem of GPU or driver.

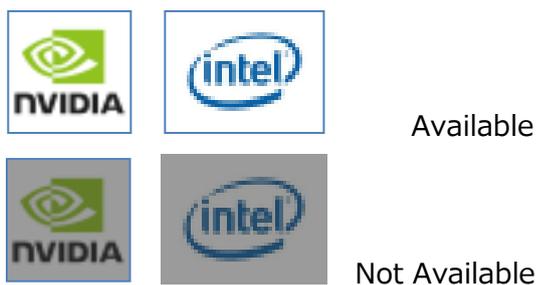


Figure 17 GPU status

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(C) Video format [Video]

Specify the format of transcode video.

W x H – Specify resolution.

Framerate – Specify framerate.

Profile – Specify the profile of ffmpeg for encoding.

Auto/Manual – Activate ffmpeg's profile on Auto / Manual.

Profile – Specify ffmpeg's profile.

Preset – Specify ffmpeg's preset.

Level – Specify ffmpeg's level.

Keyframe – Specify the keyframe insertion interval.

Bitrate – Specify bitrate

Deinterlace – Specify ON / OFF of deinterlace processing.

(D) Audio format [Audio]

Specify the format of transcode audio.

Format – Specify audio format.

Frequency – Specify audio sampling rate.

Channels – Specify audio channel.

Bitrate – Specify audio bitrate.

◀ (E) Encode GPU select [Nvidia ID]

If multiple GPUs of NVIDIA are built and SLI (Scalable Link Interface) is running, specify the GPU to be used for encode.

(F) General config [Streaming]

Specify general configs for streaming.

RTMP url – Specify RTMP url.

Stream key – Specify stream key.

Auto start – Specify stream automation.

Auto – After the broadcast starts, streaming starts automatically when the video stabilizes.

Manual – Can start / stop stream manually.

Disable (LocalRec Mode) – Disable RTMP transcode and record to the file.

Check – Disable RTMP transcode and enable recording.

Uncheck – Enable RTMP transcode and disable recording.

## 5.1 Corresponding NVIDIA drivers

When performing RTMP transcode with NVIDIA, it is necessary to confirm that the driver of NVIDIA is the latest version.

- \* If using an older driver, RTMP transcode may not work properly.
- \* If the driver does not work even if it is update, it is possible that GPU does not support NVIDIA video encode.

Please refer to the following for GPUs supported by NVIDIA.

### 5.1.1 GPU that supports NVIDIA video encode.

High Performance Computing and Hyper scale Accelerators.

[Tesla K10, K20, K40, K80, M4, M40, M6, M60, P4, P40 and newer.](#)

Desktop and Workstation.

[Quadro K2000, K2200, K4000, K4200, K5000, K5200, K6000, M4000, M5000, M6000, P5000, P6000 and newer.](#)

Mobile Workstation.

[Quadro K2000M, M2000M, K5000M and newer.](#)

Cloud Gaming, Virtual Desktops, and Cloud Enterprise.

[GRID K1, K2, K340, K520, M30, M40 and newer.](#)

Desktop and Notebook Computers (Up to 2 concurrent encode sessions per system)

[GeForce \(encoding supported only on Kepler, Maxwell and Pascal GPUs\)](#)

Cards that have been tested in our system is K2200 and K620.

We do's not guarantee all Cards.

## 5.2 RTMP transcode status window

By changing the value of the setting file, the status window of RTMP transcode is displayed.

hide\_window = 1 – Hide status window.

hide\_window = 0 – Display status window.

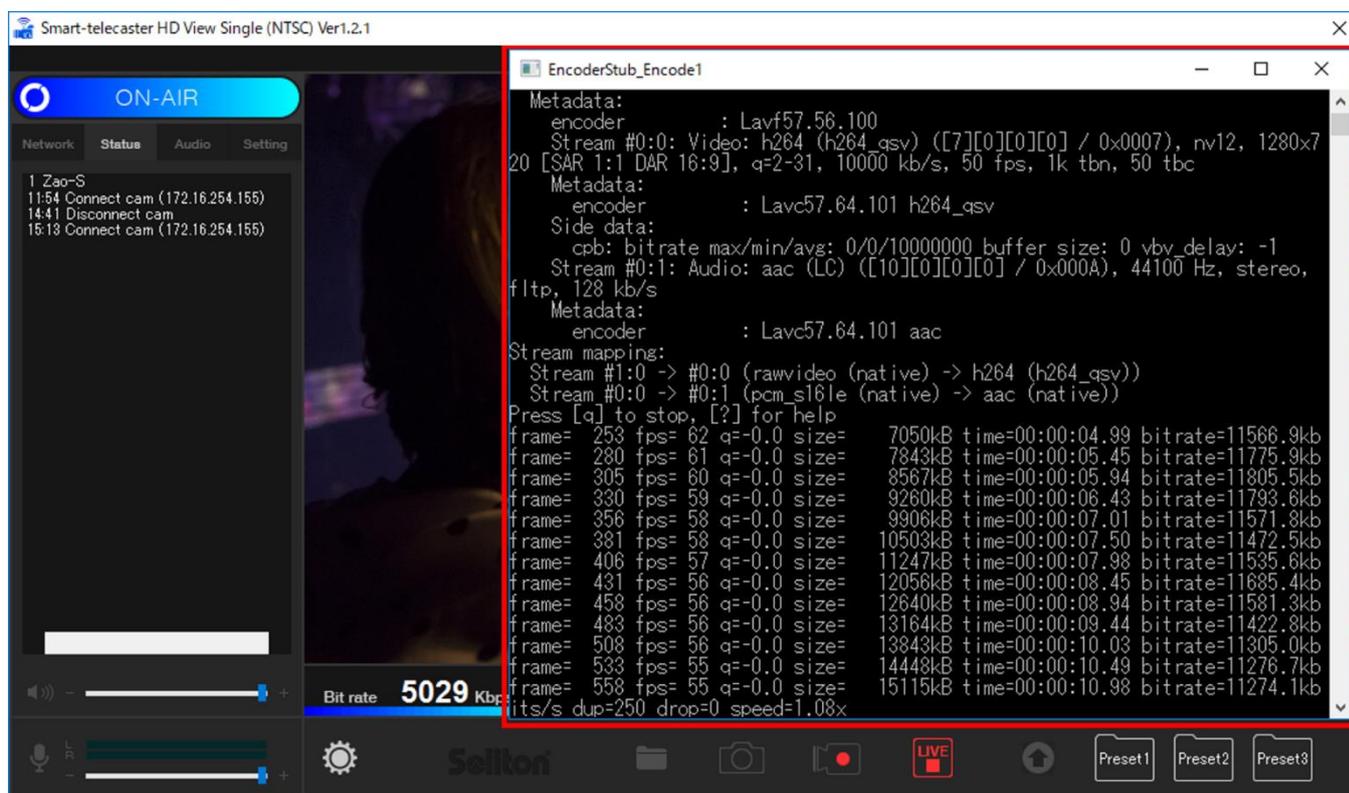


Figure 18 Status window

Location of setting file

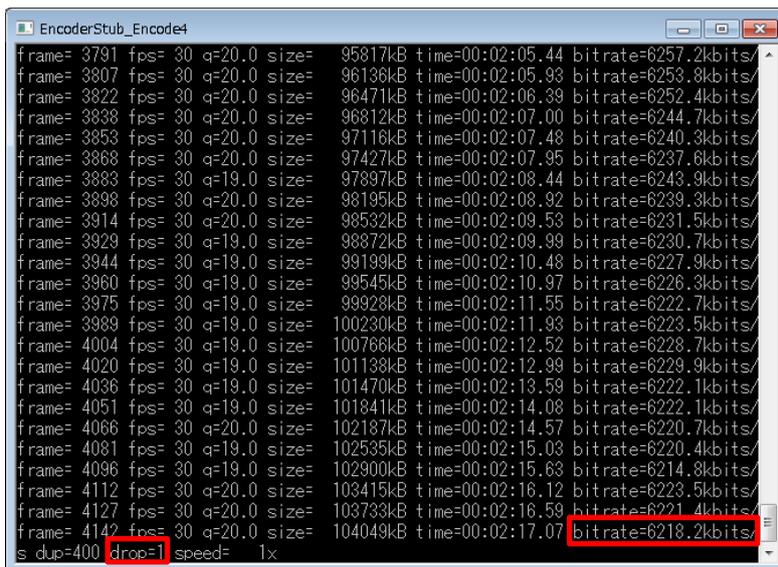
C:\Program Files (x86)\Smart-telecaster HD\STCView\EncoderStub.ini

\* Depending on your environment, EncoderStub.ini may be located differently.

```
[CONFIG]
check_interval = 1000
encstart_waittime = 500
encend_waittime = 500
comm_timeout = 300
program_reg_interval = 15000
encoder_path = "C:\Program Files (x86)\Adobe\Flash Media Live Encoder
3.2\FMLECmd.exe"
ffencoder_path = "C:\Program Files (x86)\Smart-telecaster HD\bin\ffmpeg"
vlcencoder_path = "C:\Program Files (x86)\VideoLAN\VLC\vlc"
hide_window = 1 ⇒ Please Change to 0 (Displayed).
```

Figure 19 EncoderStub.ini setting list

## 5.2.1 How to check status window.



```

EncoderStub_Encode4
frame= 3791 fps= 30 q=20.0 size= 95817kB time=00:02:05.44 bitrate=6257.2kbits/
frame= 3807 fps= 30 q=20.0 size= 96136kB time=00:02:05.93 bitrate=6253.8kbits/
frame= 3822 fps= 30 q=20.0 size= 96471kB time=00:02:06.39 bitrate=6252.4kbits/
frame= 3838 fps= 30 q=20.0 size= 96812kB time=00:02:07.00 bitrate=6244.7kbits/
frame= 3853 fps= 30 q=20.0 size= 97116kB time=00:02:07.48 bitrate=6240.3kbits/
frame= 3868 fps= 30 q=20.0 size= 97427kB time=00:02:07.95 bitrate=6237.6kbits/
frame= 3883 fps= 30 q=19.0 size= 97897kB time=00:02:08.44 bitrate=6243.9kbits/
frame= 3898 fps= 30 q=20.0 size= 98195kB time=00:02:08.92 bitrate=6239.3kbits/
frame= 3914 fps= 30 q=20.0 size= 98532kB time=00:02:09.53 bitrate=6231.5kbits/
frame= 3929 fps= 30 q=19.0 size= 98872kB time=00:02:09.99 bitrate=6230.7kbits/
frame= 3944 fps= 30 q=19.0 size= 99199kB time=00:02:10.48 bitrate=6227.9kbits/
frame= 3960 fps= 30 q=19.0 size= 99545kB time=00:02:10.97 bitrate=6226.3kbits/
frame= 3975 fps= 30 q=19.0 size= 99928kB time=00:02:11.55 bitrate=6222.7kbits/
frame= 3989 fps= 30 q=19.0 size= 100230kB time=00:02:11.93 bitrate=6223.5kbits/
frame= 4004 fps= 30 q=19.0 size= 100766kB time=00:02:12.52 bitrate=6228.7kbits/
frame= 4020 fps= 30 q=19.0 size= 101138kB time=00:02:12.99 bitrate=6229.9kbits/
frame= 4036 fps= 30 q=19.0 size= 101470kB time=00:02:13.59 bitrate=6222.1kbits/
frame= 4051 fps= 30 q=19.0 size= 101841kB time=00:02:14.08 bitrate=6222.1kbits/
frame= 4066 fps= 30 q=20.0 size= 102187kB time=00:02:14.57 bitrate=6220.7kbits/
frame= 4081 fps= 30 q=19.0 size= 102535kB time=00:02:15.03 bitrate=6220.4kbits/
frame= 4096 fps= 30 q=19.0 size= 102900kB time=00:02:15.63 bitrate=6214.8kbits/
frame= 4112 fps= 30 q=20.0 size= 103415kB time=00:02:16.12 bitrate=6223.5kbits/
frame= 4127 fps= 30 q=20.0 size= 103733kB time=00:02:16.59 bitrate=6221.4kbits/
frame= 4142 fps= 30 q=20.0 size= 104049kB time=00:02:17.07 bitrate=6218.2kbits/
s dup=400 drop=1 speed= 1x

```

Figure 20 Status window check items

If check "drop" and "bitrate" and the value of "drop" continues to increase, the encoding process may not keep up.

Please check hardware specifications and RTMP transcode.

When do RTMP transcode of 1.5Mbps or more, adding the following registry file will stabilize.

C:\Program Files (x86)\Smart-telecaster HD\bin\%f%\AFD\_param.reg

- \* Depending on your environment, AFD\_param.reg may be located differently.
- \* Using registry editor incorrectly can cause serious problems. The worst, will need to reinstall the OS. Use registry editor at your own risk.

### 5.3 RTMP transcode and file recording

Only RTMP transcode and file recording can be used.

Depending on the setting value of “video streaming”, there are different functions that operate.

#### 5.3.1 RTMP transcode

It is available when “video streaming” is “Transcode”.

- \* However, it does not work if “Disable(RocalRec Mode)” is checked.

While using the Live button is displayed on main screen.



**Figure 21 Display of Live button**

#### 5.3.2 File recording

It is available when “video streaming” is “OFF”/“Passthrough”/“NDI”.

- \* Even if “video streaming” is “Transcode”, it works by checking “Disable(RocalRec Mode)”.

While using the Snapshot and Record button is displayed on main screen.



**Figure 22 Display of Recode button**

Snapshot and record file are saved in the standard folder (“My Reports” folder in the document).

- \* If file transfer destination [Forwarding received file] is specified, it will be saved in the specified folder.

The media format of the saved file is as follows.

**Table 3 Media format list**

File type	File name	Media format
Snapshot	[Transmitter-Name]_yyyyMMddHHmmss_[ch].jpg	jpg
Record file* <sup>1</sup>	[Transmitter-Name]_yyyyMMddHHmmss_[ch].mp4	mp4
Record file* <sup>2</sup>	rptyyyyyMMddHHmmss_[ch].avi	avi

- \* 1 When the video codec is an H.265 / H.264 product.

- \* 2 When the video codec is an VP8 product

## 5. 4 Cooperation with Milestone XProtect®

Select "ONVIF" on the add hardware window of Xprotect®.

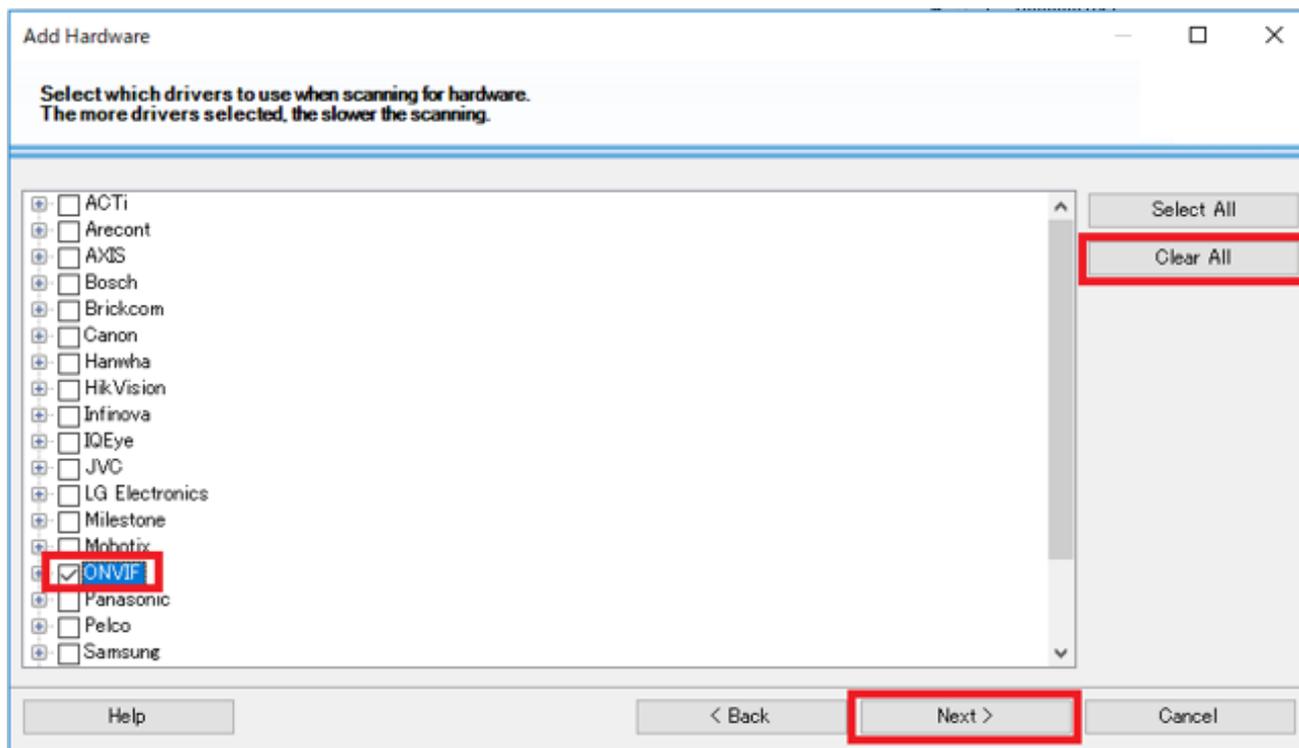


Figure 23 Add hardware window

In addition, input the following items.

Address : IP address of the PC where HD View Single is installed.

Port : 40011

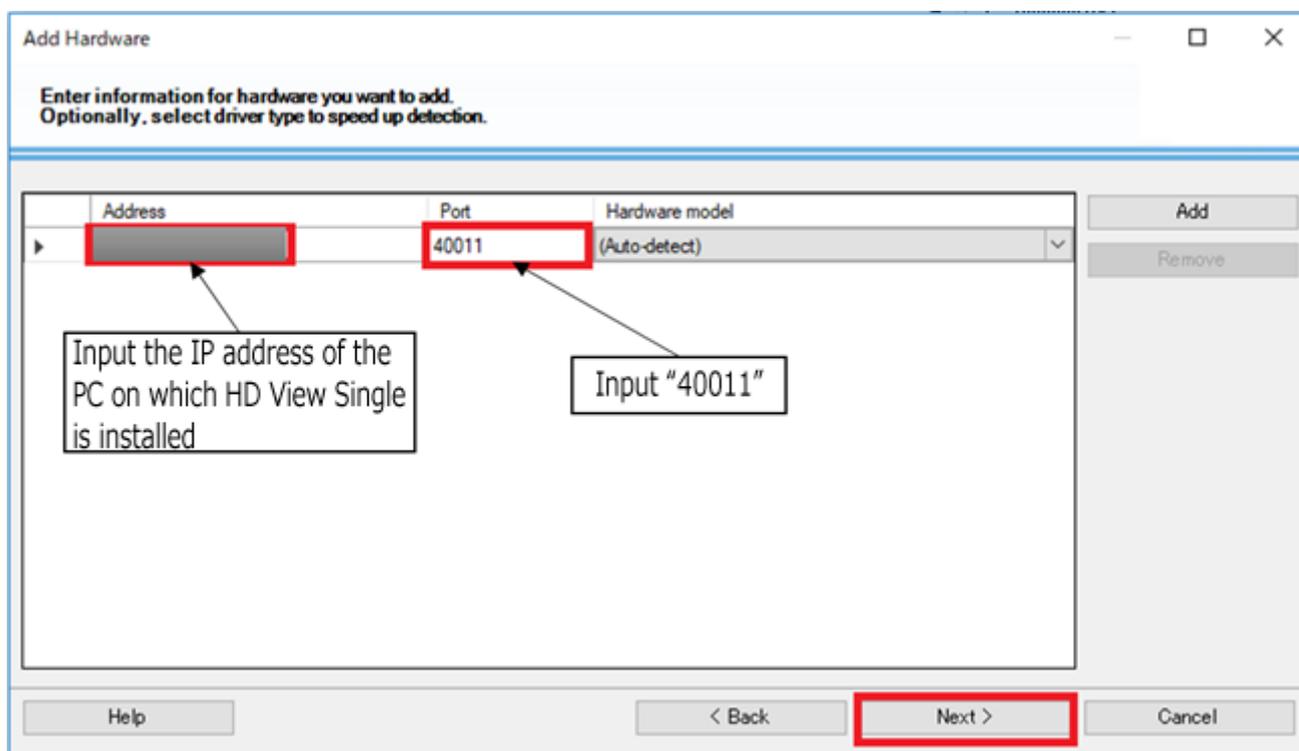


Figure 24 Input IP address and port

## 6 Main specifications

Table 4 Main specifications

Item		Details
<b>Main function</b>		Live broadcast receive (video one-way, audio bidirectional) REC&GO file receive REC&GO file (.taf) playback Snapshot save Broadcast video recode, video streaming  * REC&GO file (.taf) is generated by Smart-telecaster Zao. It is a proprietary file.
<b>License</b>		One license per Smart-telecaster Zao-S
<b>Connectable products</b>		Smart-telecaster Zao Smart-telecaster Zao-S Smart-telecaster Zao App Smart-telecaster HD Cam Smart-telecaster for iOS ML Smart-telecaster for Android ML
<b>Simultaneous connections</b>		1
<b>Delay time</b>		240msec ~ 30000msec *  * In the case of Smart-telecaster Zao/Zao-S, 480msec ~ 30000msec
<b>Coding scheme</b>	<b>Video</b>	VP8, H.265
	<b>Audio</b>	Vorbis
<b>Communication protocol / Port</b>		RASCOW: UDP 31115~31118 RTMP: TCP 1935 RTSP: TCP/UDP 20011
<b>Operating environment</b>	<b>Hardware</b>	DELL XPS15
	<b>OS</b>	Windows10 64bit * * Version 1607、After build 14393
	<b>CPU</b>	Over Core i5 2.5GHz
	<b>RAM</b>	Over 8GB
	<b>GPU</b>	Over NVIDIA® GeForce® GTX /Quadro * When using RTMP Transcode
	<b>N/W</b>	ADSL or more wired network, and fixed global IP address
<b>Video output</b>	<b>BMD device</b>	BlackmagicDesign Decklink Quad2 BlackmagicDesign Decklink Studio 4K BlackmagicDesign UltraStudio Express BlackmagicDesign UltraStudio HD mini BlackmagicDesign UltraStudio Mini Monitor
	<b>Signal format</b>	1080p 29.97/25, 1080i 59.94/50, 720p 59.94/50, 480/59.94i, 576/50i  * Depending on the signal of transmitter * When the input signal is 1080p 59.94 / 50, the stream and output signal format is 1080p 29.97 / 25
	<b>Connector</b>	Depends on BMD Device
	<b>Driver</b>	Desktop Video 10.11